

**FEDERAL BUREAU OF PRISONS  
CLINICAL PRACTICE GUIDELINES  
MANAGEMENT OF HIV INFECTION  
February, 2004**

**PURPOSE**

The BOP Clinical Practice Guidelines for the Management of HIV Infection provide guidelines for the evaluation and treatment of federal inmates with HIV infection.

**REFERENCES**

(References with **asterisks** are key United States Public Health Service (USPHS) references that should be maintained with these guidelines and updated as necessary.)

**HIV Counseling and Classification**

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**Antiretroviral Therapy**

\*Guidelines for the Use of Antiretroviral Agents in HIV-1-Infected Adults and Adolescents, Panel on Clinical Practices for Treatment of HIV Infection, convened by the Department of Health and Human Services (DHHS), November 10, 2003, updated at <http://AIDSinfo.nih.gov>

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## **Prophylaxis of Opportunistic Infections**

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*Please note that for ease of use, the page numbers in the electronic version of the index have been hyperlinked to the text of the guidelines. For example, clicking on the number 11 in the page numbers of the index will automatically move your cursor to “HIV Prevention Counseling” in the text.*

*In the printed version, page numbers are intended to correspond to text pagination; however,*

*depending on the printer used to print the text, there may unavoidable formatting differences which may result in discrepancies.*

## **DEFINITIONS**

**Adherence** is the willingness and ability of a patient to take a treatment regimen as prescribed (> 90% - 95% adherence to antiretroviral medications is ordinarily necessary for maximal HIV RNA suppression.)

**CD4+ T-cell** is a T-cell lymphocyte essential for human cellular immunity. HIV infection results in declines in CD4+ T-cells, immunosuppression, and susceptibility to opportunistic infections.

**Clinician** is a physician or mid-level provider.

**Directly observed therapy (DOT)** for HIV infection is the unit dose administration of antiretroviral medications to an inmate by a clinician, nurse, pharmacist, or specially trained staff, under direct observation of ingestion.

**EIA** is Enzyme Immunoassay, a laboratory test for detecting antibodies.

**HAART** is highly active antiretroviral therapy that can achieve sustained undetectable HIV RNA levels in infected persons.

**HIV RNA test** is a laboratory assay used to quantitatively measure the presence of HIV viral particles in serum, expressed as copies per milliliter (cps/mL) and also referred to as "**viral load**" or "**viral burden.**" HIV RNA levels are measured for the staging of HIV infection and therapeutic monitoring. Standard and ultrasensitive assays are available.

**Immune reconstitution** is regaining functional CD4+ T-cells (host cellular immunity) following treatment of a previously immunocompromised condition such as AIDS. Immune reconstitution in the context of HIV infection results from effective antiretroviral therapy and may paradoxically be associated with inflammatory reactions to certain pathogens such as *M. tuberculosis*, cytomegalovirus, and *M. avium* complex.

**Infection control precautions** include the following categories of precautions relevant to the correctional setting:

- **Standard precautions** apply to blood, all body fluids, secretions, and excretions (except sweat), regardless of whether or not they contain visible blood; nonintact skin; and mucous membranes. Standard precautions include: (1) adequate hand

hygiene measures in accordance with CDC guidelines after touching blood, body fluids, secretions, excretions (includes wound drainage), and contaminated items, whether or not gloves are worn; (2) the routine use of personal protective equipment such as gloves, masks, eye protection or face shields, and gowns whenever contact with blood, body fluids, secretions, excretions (includes wound drainage) is anticipated; (3) ensuring that environmental surfaces in the health care setting are routinely cleaned and disinfected; (4) ensuring that linens are handled and cleaned in a manner that prevents staff exposures to contaminated laundry and avoids the transfer of microorganisms from person to person or from place to place; (5) the safe disposal of needles and other sharp instruments and devices in appropriate leakproof and puncture-resistant containers; and (6) the placement of patients who may contaminate the environment or cannot be expected to maintain adequate hygiene or a sanitary environment in a private room.

- **Hospital standard precautions** are infection control practices used in the hospital setting to reduce the risk of transmission of microorganisms from both recognized and unrecognized sources of infection.

- **Correctional standard precautions** are hospital standard precautions that have been adapted to the correctional setting taking into account security issues, inmate housing factors, and infection control concerns inherent to jails and prisons.

- **Contact transmission precautions** are indicated for inmates with **pediculosis, scabies, impetigo and noncontained skin infections such as abscesses, cellulitis and decubiti; viral conjunctivitis; certain highly contagious enteric infections such as *Clostridium difficile* or patients with diarrhea and infection with hepatitis A virus, *Shigella*, or *Escherichia coli* O157:H7; and gastrointestinal, respiratory, skin or wound infections or colonization with certain multi-drug resistant bacteria such as methicillin-resistant *Staphylococcus aureus* (MRSA).** Contact precautions include routine standard precautions as well as the following additional measures:

- The inmate should be placed in a private cell. Inmates with the same infection can be housed together if single-cell status is not feasible.

- Clean nonsterile gloves should be worn when entering the cell. Gloves should be changed when grossly contaminated with potentially infectious material such as fecal material

and wound drainage. Gloves must be removed and hands cleaned immediately (i.e. by washing with an antimicrobial agent or use of a waterless antiseptic agent) before leaving the inmate's cell taking care not to touch potentially contaminated environmental surfaces or items once hands have been cleaned.

- A clean, nonsterile gown should be worn when entering the inmate's cell whenever direct inmate contact or contact with environmental surfaces or items in the cell is anticipated. The gown should be removed before leaving the inmate's cell, taking care not to have one's clothing contact potentially contaminated environmental surfaces.

- The inmate should leave his or her cell for essential purposes only. If the inmate leaves the cell, precautions should be taken to minimize the risk of transmission of microorganisms to other persons and to avoid contamination of environmental surfaces or items.

- Noncritical patient care equipment should be dedicated to a single inmate. Common medical equipment that must be shared between patients must be adequately cleaned and disinfected before use by another inmate.

- No special requirements are indicated for eating utensils. Disposable or reusable utensils may be used. The use of detergent and washing procedures for decontamination are sufficient.

- **Droplet transmission precautions** are indicated for inmates with illnesses such as **influenza, mumps, rubella, streptococcal pharyngitis or pneumonia, invasive *Haemophilus influenzae* type b disease such as pneumonia and epiglottitis, invasive *Neisseria meningitidis* disease such as meningitis and pneumonia, as well as MRSA pneumonia.** (NOTE: Inmates with an unknown respiratory illness compatible with tuberculosis should be managed with airborne precautions.)

Illnesses requiring droplet precautions are caused by infectious agents that are transmitted in large-particle droplets (> 5 µm in size) when an infectious patient coughs, sneezes, talks, or has certain procedures performed such as suctioning and bronchoscopy. Transmission of infection occurs when droplets containing the microorganism are propelled a short distance in the air and then deposited on the host's mouth, nasal mucosa, or conjunctivae. Large-particle droplets do not remain suspended in the air.

Droplet precautions include routine standard precautions as well as the following measures:

- The inmate should be placed in a private cell (**NOTE:** The cell does not require negative pressure or a special air handling system.) The door of the cell may be opened without concern that the infectious agent will be transmitted to others. Inmates with the same infection may be housed together if single-cell housing status is not feasible.
- A mask, eye protection, or a face shield should be worn to protect mucous membranes of the eyes, nose, and mouth during procedures and patient care activities that are likely to generate splashes or sprays. Masks should be worn when entering the cell or when within 3 feet of the inmate. An N95 respirator is not required.
- Contagious inmates infected with pathogens transmitted by large-droplet particles should wear a surgical mask if they must leave their cell. Inmate movement outside the cell should be limited to essential purposes.

- **Airborne transmission precautions** are protective measures used to prevent the spread of infections such as **tuberculosis, varicella (chicken pox), and rubeola (measles)** that are transmitted by inhalation of microorganisms, 5 µm or smaller in size. These tiny germs can remain suspended in airborne nuclei in poorly circulated air and can be potentially transmitted over long distances from the source patient.

Infection control airborne precautions include the isolation of contagious inmates in a cell with monitored, negative air pressure in accordance with CDC guidelines and Bureau policy. Inmates infected with the same microorganism can be cohorted together in the same cell. If a negative pressure cell is not available the optimal management of the inmate should be determined on a case-by-case basis in consultation with a knowledgeable infection control practitioner.

Staff entering the cell of an inmate with pulmonary tuberculosis should wear appropriate respiratory protection (i.e., HEPA or N-95 respirators.) Susceptible staff should not enter the cell of inmates with varicella or measles unless it is absolutely essential, and then they should wear respiratory protection. Staff immune to varicella or measles do not require respiratory protection when entering the cell of an isolated inmate with

varicella or measles. Contagious inmates infected with pathogens transmitted by airborne microorganisms should wear a surgical mask if they must leave negative-pressure isolation for medically necessary procedures or for security reasons.

- **Correctional transmission-based precautions** are contact, droplet, and airborne precautions that have been adapted to the correctional setting taking into account relevant security concerns, inmate housing factors, and infection control issues inherent to jails and prisons.

**Non-occupational exposures** refer to exposures to HIV that occur outside the performance of assigned work-related duties. Non-occupational exposures include unprotected sex, sharing of injection drug use equipment, or sharing other puncture-type devices such as tattoo equipment that could transmit infected blood.

**Occupational exposures** refer to reasonably anticipated contacts with HIV-infected blood or other potentially infectious materials that may result from the performance of assigned work-related duties.

**Prophylaxis** is the provision of a treatment to prevent a specific infection and can be primary or secondary.

- **Primary prophylaxis** is the provision of a treatment to prevent a specific infection in a person who is at risk for the infection, but who has not previously been infected.

- **Secondary prophylaxis** is the continued provision of antibiotics following the successful treatment of a specific infection in order to prevent the recurrence of the infection.

**Resistance testing for HIV** refers to genotypic and phenotypic assays that assess HIV resistance to specific antiretroviral drugs. Genotypic assays measure specific mutations to viral enzymes (reverse transcriptase/protease). Phenotypic assays measure the ability of HIV to grow in various concentrations of antiretroviral drugs.

**Undetectable HIV** is the measurement of HIV RNA at levels that are below the level of detectability of specific assays. The goal of antiretroviral therapy is to achieve viral suppression to < 50 cps/mL.

## 1. DIAGNOSIS AND REPORTING

### Indications for testing:

- **All inmates:** The following inmates should be tested for HIV infection regardless of their sentencing status or anticipated length of incarceration:

- Inmates with signs or symptoms of acute HIV infection;
- Inmates with signs or symptoms of any HIV-related conditions, including, but not limited to, thrush, herpes zoster, oral hairy leukoplakia, severe seborrhea, unexplained lymphadenopathy, and opportunistic infections;
- Pregnant women; (**NOTE:** The U.S. Public Health Service recommends HIV testing for all pregnant women as early as possible during pregnancy. Approximately 25% of HIV-infected pregnant women who are not treated during pregnancy transmit HIV to their infants during pregnancy, during labor and delivery, or through breast feeding. Current antiretroviral therapy and obstetrical interventions markedly reduce the risk of transmitting HIV from infected mothers to their infants);
- Inmates with recent exposures to HIV;
- Inmates with active tuberculosis (TB) or a positive tuberculin skin test;
- As clinically indicated on a case-by-case basis.

- **Asymptomatic sentenced inmates:** Many persons with HIV infection are asymptomatic and are unaware that they are infected. BOP clinicians should have a very low threshold for testing inmates for HIV infection, even if asymptomatic, since infected inmates will benefit from counseling and may be candidates for life-prolonging antiretroviral therapy. The following asymptomatic inmates should be screened for **HIV-1** infection in accordance with Bureau policy when the following risk factors for HIV infection or conditions associated with HIV infection are clinically suspected or self-reported:

- Inmates who have ever injected drugs or shared drug use equipment with others;
- Male inmates who have had sex with another man;

- Inmates who have had unprotected vaginal or anal intercourse with more than one sex partner;
- Inmates who have had unprotected intercourse with a person with known or suspected risk factors for HIV infection;
- Inmates with a history of syphilis, sexually transmitted diseases, sexual abuse, or prostitution;
- Inmates with hemophilia and any inmate who has received blood products between 1977 and May, 1985;
- Inmates transferred from a correctional system with known HIV seroprevalence of  $\geq 1\%$ ;
- Inmates from countries where HIV infection is endemic such as Sub-Saharan Africa and West Africa.

The following asymptomatic sentenced inmates should also be tested for **HIV-2** infection through BOP reference laboratories:

- Inmates from West Africa where HIV-2 is endemic such as the countries of Benin, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, Togo, Ghana, Burkina Faso, Gambia, and Côte d'Ivoire;
- Inmates who are or have been sex partners or needle-sharing partners of persons from West Africa or any person known to have HIV-2 infection;
- Inmates who have received transfusions in West Africa.

**NOTE:** Asymptomatic inmates with risk factors for HIV infection who are not tested during transient periods of incarceration should be referred for HIV testing in the community.

**HIV Prevention Counseling:** All inmates tested for HIV infection should receive counseling by qualified health care personnel in accordance with BOP policy using the appropriate forms for HIV counseling and documentation. Counseling includes information on HIV transmission, methods for preventing the spread of the virus while in prison and upon release to the community, the importance of obtaining test results, how to get the test results, and the meaning of the HIV test results. HIV prevention counseling should incorporate effective elements recommended by the CDC that include, but are not limited to: using open-ended questioning, carefully assessing personal risk based on self-reported behaviors and the inmate's medical evaluation, clarifying

critical misconceptions, emphasizing risk reduction behaviors, and using clear and direct language when providing test results.

**Antibody Detection:** Only FDA-approved HIV tests should be used for diagnostic purposes. The diagnosis of HIV infection is ordinarily determined by a positive EIA for HIV-1 antibodies that is confirmed by immunoblot (Western blot) analysis. Results of HIV Western blots are generally interpreted as follows:

- **NEGATIVE:** nonreactive (no bands on Western blot);
- **POSITIVE:** reactivity to gp41 + gp120/160; OR p24 + gp120/160;
- **INDETERMINANT:** presence of any band patterns that do not meet the criteria for a positive result.

The standard EIA and Western blot assays are > 98% specific and sensitive for detecting HIV infection. False negative, false positive, and indeterminant results are uncommon but have been documented.

**False Negative** HIV test results can occur for the following reasons:

- Recent acute HIV infection: During the "window" period (i.e., the time between new infection and the development of HIV antibodies), HIV EIA tests may be negative. The time delay from recent infection to positive serology averages 14-22 days. Nearly all infected persons develop HIV antibodies within 6 months of infection;
- Seroreversion: Persons with documented HIV infection can lose HIV antibodies either with late stage disease (AIDS), or with immune reconstitution with effective antiretroviral therapy;
- Agammaglobulinemia (low antibodies);
- Atypical HIV strains: Standard EIA may be falsely negative in persons infected with HIV O subtype, HIV N subtype, or HIV-2. O and N subtypes are extremely rare variants of HIV-1. HIV-2 infection occurs primarily in West Africa. Standard HIV EIA tests are falsely negative in 20-30% of persons infected with HIV-2. Specific antibody tests for HIV-2 are available through the CDC via BOP reference laboratories.

**False Positive** HIV test results are extremely uncommon, but can occur rarely from autoantibodies. Most cases of false positive

HIV test results occur in persons who have received investigational HIV vaccines or through clerical errors.

**Indeterminant** HIV test interpretations of Western blots are associated with the following:

- Recent infection: HIV antibodies differentially become detectable weeks after infection which may result in an indeterminant Western Blot;
- Atypical HIV strains: Infection with unusual strains of HIV such as HIV-2 infection, or HIV-1 subtypes O or N, may not produce typical diagnostic bands on Western blot analysis;
- Cross reactive antibodies: Autoimmune diseases, certain malignancies, injection drug use, HIV vaccination, and recent immunization may yield antibodies that are detectable on HIV Western blot analysis;
- Advanced HIV infection: Loss of HIV antibodies because of AIDS itself may affect Western blot analysis.

Inmates with indeterminant HIV test results should be referred to a physician for further evaluation in accordance with the following guidelines:

- Physician interview for HIV infection risk factors, symptoms of HIV infection and AIDS, and causes of indeterminant HIV test results;
- Physician evaluation of the inmate for conditions that may result in an indeterminant test result when clinically indicated based on the inmate's history and examination;
- Repeat HIV testing, e.g., in 1, 2, and 6 months (If the HIV test result remains indeterminant at 6 months, and the inmate has no risk factors for HIV infection, the inmate should be reassured that HIV infection is extremely unlikely. If HIV infection is suspected, despite indeterminant HIV test results, BOP Medical Referral Center laboratory personnel should be consulted for further evaluation of the test results. Viral detection methods may be used on a case-by-case basis as an adjunctive diagnostic tool, but should not supplant antibody testing).

**Acute HIV Infection** is most rapidly diagnosed by detecting plasma HIV RNA in a person before HIV antibodies have developed. Measurement of viremia, however, does not negate the need for HIV antibody testing, since both false negative and false positive

quantitative HIV RNA tests can occur when evaluating a patient with suspected acute HIV infection. Acute HIV infection is confirmed or excluded as a diagnosis by measuring for HIV antibodies. Testing for acute HIV infection should be pursued for inmates with a suggestive clinical presentation or history of a recent exposure to HIV.

**Reporting:** All inmates diagnosed with HIV infection should be reported to State health authorities in accordance with State laws and regulations.

## **2. NATURAL HISTORY OF HIV INFECTION**

Acute HIV infection results in marked HIV viremia with a rapid decline in CD4+ T-cells that is usually associated with significant symptomatology, most commonly fever, rash, lymphadenopathy and fatigue. Acute HIV infection is frequently unsuspected by the evaluating clinician, since signs and symptoms are relatively nonspecific and may not be reported by the patient. Less common manifestations of acute HIV infection include thrush, mucocutaneous ulcerations of the mouth and esophagus, diarrhea, aseptic meningitis, facial palsy, Guillain-Barre syndrome, and cognitive impairment.

An avid immune response develops following acute HIV infection that is associated with HIV antibody development, an increase in CD4+ T-cells, and a reduction in HIV viremia with the establishment of a viral load "set point." Over time the CD4+ T-cell count gradually declines in persons chronically infected with HIV, whereas HIV RNA levels gradually increase. In the absence of antiretroviral therapy, the average time from acute HIV infection to late stage HIV infection or AIDS is 10 years. AIDS is associated with marked immunosuppression with a CD4+ T-cell count  $< 200/\text{mm}^3$ , the development of opportunistic infections, neurologic complications, certain malignancies, and wasting syndrome. Antiretroviral therapy markedly prolongs life and prevents the development of AIDS. Although antiretroviral therapy can suppress plasma HIV RNA to undetectable levels for years, treatment is not curative since reservoirs of HIV persist, particularly in latent CD4+ T-cells.

HIV-2 infection causes a cell-mediated immunodeficiency similar to HIV-1 infection, however CD4+ T-cells decline more slowly with HIV-2 infection compared to HIV-1 infection.

## **3. BASELINE MEDICAL EVALUATION**

A baseline medical evaluation is indicated for inmates diagnosed

with HIV infection that ordinarily includes the following components as outlined in **Appendix 1: Baseline and Periodic Medical Evaluations for Inmates with HIV Infection.**

**History and Physical Examination** should include the following:

- Medical history including assessment and documentation of HIV risk factors;

- Complete physical examination including but not limited to a funduscopic examination for retinopathy, oropharyngeal exam for thrush, careful skin exam for dermatologic conditions, abdominal exam for hepatosplenomegaly, assessment of neurologic deficits, and pelvic examination and PAP smear for women;

(PAP smears should be obtained in accordance with the following guidelines from Bartlett and Gallant [See references]: The cervix is scraped circumflexually using an Ayer spatula or a curved brush; a sample from the posterior fornix or the vaginal pool may also be included. The endocervical sample is taken with a saline-moistened cotton-tipped applicator or straight brush that is rolled on a slide and immediately fixed in ethyl ether plus 95% ethyl alcohol or 95% ethyl alcohol alone. The yield is seven-fold higher with the brush specimen. Important steps in obtaining an adequate sample:

- Collect PAP smear prior to bimanual exam;
- Avoid contaminating sample with lubricant;
- Obtain PAP before testing for sexually transmitted diseases;
- If large amounts of vaginal discharge are present, carefully remove with large swab before obtaining PAP;
- Obtain ectocervical sample before endocervical sample;
- Small amounts of blood will not interfere with cytologic sampling but if bleeding is heavy, the PAP should be deferred;
- Collected material should be applied uniformly to a slide, without clumping, and should be rapidly fixed to avoid air-drying; if spray fixatives are used, the spray should be held at least 10 inches away from the slide to prevent disruption of cells by propellant.)

**Staging Assessment**

- **CD4+ T-cells:** The measurement of CD4+ T-cells is essential for immunologic staging of inmates with HIV infection and for therapeutic monitoring and initiation of prophylaxis for opportunistic infections associated with HIV infection. A normal CD4+ T-cell count ranges from 800 to 1050/mm<sup>3</sup>. The CD4+ T-cell count may decline with concurrent illnesses, major surgery, and particularly with corticosteroid administration. Splenectomy and HTLV-1 co-infection may increase CD4+ T-cell counts.

CD4+ T-cell counts are subject to significant variability and can vary up to 30 percent on repeated measures in the absence of a change in the patient's clinical condition. Diurnal and analytical variations in measuring CD4+ T-cells are common. The following caveats may assist the clinician in determining the inmate's immune status or help interpret CD4+ T-cell results:

- Any changes in the absolute number of CD4+ T-cells should be reviewed to determine if the percentage of CD4+ T-cells has also comparatively changed, since a decline in the absolute WBC count that is not related to HIV infection will often be reflected in a decline in CD4+ T-cells, while the percentage of CD4+ T-cells remains nearly constant;

- The immune status of inmates with HIV infection who refuse CD4+ T-cell assays can be roughly assessed by the absolute lymphocyte count. (A total lymphocyte count of < 1,200/mm<sup>3</sup> strongly correlates with a CD4+ T-cell count of < 200/mm<sup>3</sup>);

- Inmates with HIV infection and unexplainable elevated CD4+ T-cells (poor correlation with clinical history/stage of infection) may have HTLV-1 co-infection. HTLV-1 is a retrovirus that increases the levels of CD4+ T-cells and is the cause of adult T-cell leukemia and tropical spastic paraparesis. HTLV-1 infection is associated with injection drug use (roughly 10% co-infection rate) and foreign-birth history (particularly high rates of co-infection occur in persons from Haiti and Brazil);

- CD8+ T-cell counts are not helpful in predicting progression of HIV infection.

- **Quantitative Plasma HIV RNA (Viral Load):** Plasma HIV RNA should be measured using an FDA-approved method at the time of diagnosis. The same laboratory using the same HIV RNA assay should be utilized to minimize test variability in accordance with Bureau policy. The measurement of HIV viral burden within one month of an acute illness or immunization should be avoided due to false elevations.

**NOTE:** The viral load correlates with the rate of CD4+ T-cell decline, the risk of opportunistic infections in persons with CD4+ T-cells < 200/mm<sup>3</sup>, and the risk of transmitting HIV to others.

**Laboratory and Diagnostic Studies** should include the following:

- CBC with differential and platelet count;
- Serum chemistries: e.g., electrolytes, creatinine, and liver transaminases;
- Viral hepatitis serologies to screen for prior infection: anti-HAV IgG for hepatitis A, anti-HBc IgG for hepatitis B, and anti-HCV for hepatitis C. Inmates with elevated liver transaminases should have HBsAg measured as well to determine if chronic HBV infection is present;
- Syphilis serologies that includes a screening RPR or VDRL with a confirmatory test (FTA) for positive screening tests (**NOTE:** false positive RPR/VDRL tests are common in persons with histories of injection drug use, a confirmatory test is essential);
- Toxoplasma IgG titer (Toxoplasmosis IgG titers identify candidates for prophylaxis and are helpful diagnostically for patients with central nervous system lesions (**NOTE:** IgM titers are not clinically useful);
- Fasting lipid profile prior to initiating HAART, since certain antiretroviral medications can cause hyperlipidemia;
- Tuberculin skin test/symptom review for TB symptoms (**NOTE:** anergy testing is not routinely recommended due to poor standardization of testing antigens and the failure of anergy testing to predict tuberculin skin test reactivity);
- Chest radiograph even if asymptomatic to evaluate for occult TB or other diseases.

**Immunization** status should be reviewed with particular attention to the following:

- Viral hepatitis prevention: Inmates with HIV infection at risk of acquiring HAV and HBV infections should receive vaccinations for hepatitis A and B;
- Bacterial pneumonia: Inmates with a CD4+ T-cell count  $\geq$  200

cells/mm<sup>3</sup> should receive a single IM dose of the pneumococcal vaccine if they have not received this vaccination during the past five years. Immunization should also be considered for inmates with CD4+ T-cell counts < 200 cells/mm<sup>3</sup>, however, the efficacy of vaccination for these patients is unknown. The duration of protection from primary pneumococcal vaccination is unknown. Revaccination should be considered for inmates who have a CD4+ T-cell count of < 200 cells/mm<sup>3</sup> at the time of initial vaccination that has subsequently increased to > 200 cells/mm<sup>3</sup> with effective antiretroviral therapy;

- Influenza prevention: Influenza vaccine should be administered in late autumn and repeated annually.

### **Referrals and Treatment Plan**

All inmates receiving a baseline evaluation for HIV infection should have a treatment plan developed by the evaluating clinician and approved by a physician. Subspecialty referrals should be initiated as medically necessary and should include:

- Referral for dental examination by a dentist for all inmates;
- Psychology referral if clinically indicated (in addition to mandatory referral made as part of post-test counseling in accordance with BOP policy).

### **4. CLASSIFICATION OF HIV INFECTION**

All inmates diagnosed with HIV infection should be classified in accordance with the CDC classification system as outlined in **Appendix 2: HIV Classification System (1993 CDC Criteria)**. HIV risk factors and classification should be documented appropriately. Reclassification and updated documentation of an inmate's HIV reclassification is indicated only when an inmate progresses to a more advanced stage of HIV infection, **not** during each evaluation or with clinical improvement.

### **5. PERIODIC MEDICAL EVALUATIONS**

Periodic medical evaluations of inmates with HIV infection should include the following evaluations:

**History and Physical Examination:** The frequency of physical examinations for inmates with HIV infection by clinicians should be based on the inmate's immune status and other relevant clinical factors as determined by the inmate's physician. Medically complex inmates and inmates with AIDS should be

followed closely by a physician. General guidance is provided in **Appendix 1**. Patient interviews and physical examinations should target the diagnosis of complications of HIV infection consistent with the inmate's stage of disease.

**Staging Assessment:** The inmate's immunologic status should be assessed by the measurement of CD4+ T-cell counts and plasma HIV RNA levels using FDA-approved testing methods. The recommended frequency of routine CD4+ T-cell and HIV plasma RNA testing should be determined on a case-by-case basis, but general guidelines are outlined in **Appendix 1**. The indications and frequency of other laboratory monitoring depends on the inmate's antiretroviral treatment regimen and prophylactic regimen for opportunistic infections. The measurement of p24 antigen, neopterin, and  $\beta$ -2 microglobulin levels are not routinely indicated. These markers are less reliable than plasma HIV RNA levels and do not add significant prognostic information for the clinician.

**Laboratory and Diagnostic Studies:** The following additional studies should be considered during periodic evaluations of inmates with HIV infection:

- **Tuberculin skin tests** are indicated annually for all inmates with measurements of < 5 millimeters induration. Inmates with HIV infection and a tuberculin skin test of 5 millimeters or greater are candidates for treatment of latent TB infection if the evaluation for active TB disease is negative. Inmates with HIV and latent TB co-infection who refuse treatment of latent TB infection should have annual chest radiographs, regardless of symptoms, to screen for active TB disease.

- **Glucose-6-phosphate dehydrogenase (G-6-PD)** deficient inmates are susceptible to hemolytic anemia when exposed to oxidant drugs such as dapsone, primaquine, and less commonly sulfonamides. Baseline G-6-PD testing is not routinely recommended for inmates with HIV infection. G-6-PD testing should be assessed for at-risk inmates prior to initiating a potentially offending agent. African Americans, and persons from Mediterranean countries, India, and Southeast Asia are most susceptible. Hemolysis is usually self-limited, involving only the older red blood cells. A small subset of Mediterraneans have a genetic variant that causes severe hemolysis when exposed to oxidant drugs. Affected patients present with severe fatigue, dyspnea, anemia, high bilirubin and LDH, reticulocytosis, methemoglobinemia, and "bite cells" on peripheral smear. During hemolysis, G-6-PD levels may be normal despite an inherent deficiency as susceptible cells are destroyed. Testing may not detect G-6-PD deficiency until 30

days after cessation of the offending drug.

- **Serum lipid analysis:** Inmates with cardiovascular risk factors or elevated baseline fasting triglyceride levels or LDL cholesterol levels should have lipid parameters monitored periodically while on antiretroviral therapy. The frequency of monitoring and the decision to medically intervene should be made on a case-by-case basis depending on the inmate's medical history and the severity of any lipid abnormalities. More aggressive monitoring and treatment is indicated for inmates with multiple cardiovascular risk factors, pre-existing heart disease, diabetes, and other relevant complicating conditions.

- **Pap smears:** Young women with HIV infection are at higher risk of cervical cancer than women without HIV infection. A pelvic examination and PAP smear should be repeated at 6 months if normal at baseline, and then repeated annually thereafter. Abnormal PAP smears should be managed as follows:

- Inmates with evidence of inflammation should be evaluated for infection and receive a repeat PAP smear in 3 months;

- Inmates with PAP smears with cellular atypia or atypical squamous cells of uncertain significance (ASCUS) should have follow-up PAP smears without colposcopy every 6 months for 2 years until 3 PAP smears are negative. If atypia is noted a second time the inmate should be referred for colposcopy. (NOTE: Can also perform HPV testing in patients with ASCUS to identify HPV types 16, 18, 31, 33, or 35 that predispose to cervical cancer and warrant colposcopy);

- Inmates with PAP smears with low-grade cervical intraepithelial neoplasia (CIN I) require careful follow-up with repeat PAP smears every 6 months and referral for colposcopy if any repeat PAP smear is abnormal;

- Inmates with high-grade cervical intraepithelial neoplasia (CIN II or III), also termed carcinoma *in situ*, require colposcopy, biopsy, and close monitoring. Inmates with invasive carcinoma require immediate referral to a specialist for evaluation and treatment.

**Other Evaluations and Treatments,** including subspecialty consultations, should be considered on a case-by-case basis depending on the inmate's medical problems and specific treatment needs. Influenza vaccination should be provided annually.

## **6. PROPHYLAXIS FOR OPPORTUNISTIC INFECTIONS (OIs)**

**Indications and Prophylaxis Regimens:** Primary prophylaxis for opportunistic infections is indicated for inmates with HIV infection and significant immunosuppression (reduction in CD4+ T-cells) to prevent acute illnesses that may require hospitalization. Prophylaxis should be prescribed in accordance with the most recent USPHS recommendations. Specific recommendations for prophylaxis for *Pneumocystis carinii* pneumonia (PCP), *Toxoplasma gondii*-associated encephalitis, and disseminated infection with *Mycobacterium avium* complex (MAC) are outlined in **Appendix 3, Prophylaxis for HIV-Related Opportunistic Infections**. Primary prophylaxis for other opportunistic infections should be initiated in accordance with the following:

- **Latent tuberculosis infection:** Persons with HIV infection who are exposed to *M. tuberculosis* are at exceedingly high comparative risk of developing active TB disease. Treatment of latent *M. tuberculosis* infection is indicated for inmates with HIV infection who have tuberculin skin test results of five millimeters or greater. (**NOTE:** Inmates who are close contacts of a contagious TB case require treatment for latent TB regardless of their tuberculin skin test measurement.) The preferred treatment regimen is isoniazid (900 mg) twice weekly p.o. (separated by at least two days), administered by direct observation for 9 months (76 doses); plus pyridoxine 50 mg - 100 mg p.o. twice weekly (or 50 mg daily dose) with monthly assessments for clinical signs and symptoms of hepatotoxicity.

- **Cytomegalovirus (CMV):** Primary prophylaxis for CMV infection with oral gancyclovir is not routinely indicated despite severe immunosuppression (CD4+ T-cells < 50/mm<sup>3</sup>) and positive CMV IgG titers. Although gancyclovir has efficacy as a prophylactic agent, gancyclovir treatment does not increase survival, may promote CMV resistance, and requires a significant pill burden for the patient. Gancyclovir prophylaxis should be considered on a case-by-case basis for inmates with unique indications. Acyclovir or valacyclovir should not be prescribed for CMV prophylaxis.

- **Fungal infections:** Primary prophylaxis for fungal infections is not routinely indicated for patients with AIDS. Although primary prophylaxis with fluconazole for oral candidiasis is effective, long term fluconazole may promote candidal resistance, is not cost effective, and is less clinically important, since oral candidiasis is usually readily treatable with short term fluconazole therapy. Primary fluconazole prophylaxis for cryptococcosis (CD4+ T-cells < 50/mm<sup>3</sup>) and primary itraconazole

prophylaxis for histoplasmosis ( $\text{CD4}^+$  T-cells  $< 100/\text{mm}^3$ ) may be considered for inmates with unique indications.

Treatment regimens for inmates with HIV infection who develop opportunistic infections and chronic maintenance therapy (secondary prophylaxis) are outlined in referenced USPHS guidelines.

**Discontinuation of OI Prophylaxis:** Discontinuation of primary and secondary prophylaxis of opportunistic infections should be considered on a case-by-case basis using the following USPHS guidelines:

- ***Pneumocystis carinii* (PCP):** Primary and secondary prophylaxis for PCP can be discontinued for inmates whose  $\text{CD4}^+$  T-cells increase to  $> 200/\text{mm}^3$  for at least 3 months in response to HAART therapy. Primary or secondary prophylaxis should be reintroduced if the  $\text{CD4}^+$  T-cell count decreases to  $< 200 \text{ cells}/\text{mm}^3$  or if PCP reoccurs at a higher  $\text{CD4}^+$  T-cell count.

- ***Toxoplasma gondii*:** Primary prophylaxis for toxoplasmosis encephalitis can be discontinued for inmates whose  $\text{CD4}^+$  T-cells increase to  $> 200/\text{mm}^3$  for at least 3 months in response to HAART therapy. Secondary prophylaxis (chronic maintenance) for toxoplasmosis can be discontinued on a case-by-case basis for asymptomatic inmates whose  $\text{CD4}^+$  T-cells have increased to  $> 200/\text{mm}^3$  for at least 6 months in response to HAART. Primary or secondary prophylaxis should be reinitiated if the  $\text{CD4}^+$  T-cell count decreases to  $< 200 \text{ cells}/\text{mm}^3$ .

- ***Mycobacterium avium* complex (MAC):** Primary prophylaxis for disseminated MAC disease can be discontinued for inmates whose  $\text{CD4}^+$  T-cells increase to  $> 100/\text{mm}^3$  for at least 3 months. Secondary prophylaxis (chronic maintenance) for disseminated MAC disease can be discontinued on a case-by-case basis for asymptomatic inmates who have successfully completed a 12 month course of MAC treatment, and have a sustained increase in their  $\text{CD4}^+$  T-cells to  $> 100/\text{mm}^3$  for at least 6 months on a HAART regimen.

- **Cytomegalovirus (CMV):** Secondary prophylaxis (chronic maintenance) for CMV can be discontinued for inmates with a history of CMV retinitis on a case-by-case basis in consultation with the treating ophthalmologist if the  $\text{CD4}^+$  T-cell count increases to  $> 100\text{--}150/\text{mm}^3$  for at least 6 months in response to HAART. Factors to consider before discontinuing secondary prophylaxis include inmate adherence to HAART, the location and extent of retinal disease, and the vision in the contralateral

eye. Close follow-up with an ophthalmologist is indicated. Prophylaxis should be reinitiated if the CD4+ T-cell count decreases to  $< 100\text{--}150/\text{mm}^3$ .

- **Fungal infections:** Secondary fluconazole prophylaxis (chronic maintenance) for **cryptococcosis** can be discontinued on a case-by-case basis for asymptomatic inmates whose CD4+ T-cells increase to  $> 100\text{--}200/\text{mm}^3$  for at least 6 months in response to HAART. Fluconazole should be reinitiated if CD4+ T-cells decline to  $< 100\text{--}200/\text{mm}^3$ . Inmates with prior **histoplasmosis** ordinarily require lifelong secondary prophylaxis with oral itraconazole (200 mg twice daily). Similarly, inmates with prior **coccidioidomycosis** ordinarily require lifelong secondary prophylaxis with either oral fluconazole (400 mg daily) or oral itraconazole (200 mg twice daily) despite immune reconstitution, since data regarding the management of these patients are limited.

## **7. TREATMENT: ANTIRETROVIRAL THERAPY**

**Timing and Indications for Therapy:** Complete eradication of HIV is not achievable with current medications, however, HAART can suppress HIV to undetectable levels for sustained periods and prolong life. The optimal time for initiating antiretroviral therapy in asymptomatic patients without AIDS is unknown. The most recent guidelines recommend a conservative approach to initiating HAART in asymptomatic patients due to the adverse effects of currently available drugs on quality of life, the unknown long term health consequences of antiretroviral therapy, the requirement for strict adherence to drug regimens, and the potential for limiting future treatment options.

Antiretroviral therapy should ordinarily be provided to inmates in accordance with Department of Health and Human Services (DHHS) recommendations as outlined in **Appendix 4, Antiretroviral Treatment Indications for HIV Infection**. HAART is definitively indicated for inmates with AIDS (CD4+ T-cell count  $< 200/\text{mm}^3$ ) or severe symptoms of AIDS. Additionally, inmates with acute HIV infection or documented HIV infection within the past 6 months, should be considered for antiretroviral therapy on a case-by-case basis. Asymptomatic inmates with CD4+ T-cells  $200\text{--}350/\text{mm}^3$  should strongly be considered for HAART, however, some experts recommend deferring treatment in such patients with low HIV RNA levels, e.g.,  $< 20,000$  cps/mL. Inmates with CD4+ T-cells  $> 350/\text{mm}^3$  ordinarily should not be treated with HAART, however, those inmates with significant elevations in HIV RNA, e.g.  $> 55,000$  cps/mL, should be monitored closely and considered for HAART on a case-by-case basis.

The decision to initiate antiretroviral therapy should be weighed very carefully, since treatment is most effective with the initial regimen. The inmate's immunologic status, potential drug toxicities, length of anticipated incarceration, motivation, and history of previous adherence to medical treatments should all be considered before initiating treatment. Strict adherence to antiretroviral therapy is necessary for drug effectiveness and preventing drug resistance. In one report, HIV RNA levels were reduced to < 500 cps/mL in roughly 80% of patients who were > 95% adherent to the medication regimen; compared to roughly 30% of patients who were 80% adherent. Patient adherence should be assessed individually. Gender, race, prior socioeconomic status, educational level, and a prior history of illicit drug use do not reliably predict future patient adherence to prescribed drug regimens. Predictors of poor adherence to HIV medications include: poor clinician-patient relationship, depression or other mental illness, active drug or alcohol use, and lack of patient education. Inmate education by clinicians, pharmacy, and nursing staff is critical before initiating complicated antiretroviral drug treatment regimens. Counseling should include a discussion of the risks and benefits of HAART, potential drug side effects, methods for managing side effects, instructions for taking scheduled medications by dose and time, and the need to report missed doses. Mental health conditions should be evaluated, treated, and stabilized, prior to initiating antiretroviral therapy. Antiretroviral medications should initially be administered by direct observation on a dose by dose or daily basis. Directly observed medication delivery should be maintained or gradually changed to inmate self-administration at the discretion of the treating physician based upon patient adherence and the virologic response to therapy. Soon-to-be-released inmates on directly observed antiretroviral medications should be gradually transitioned to a self-administration regimen prior to release.

**Initial Drug Regimens:** The selection of an initial antiretroviral treatment regimen should ordinarily be consistent with one of the two preferred regimens listed in the most recent DHHS guidelines (See <http://www.AIDSinfo.nih.gov>).

- (1) A non-nucleoside reverse transcriptase inhibitor (NNRTI) containing regimen: **Efavirenz + lamivudine + (zidovudine or tenofovir DF or stavudine)** (NOTE: efavirenz is contraindicated in pregnancy); OR

- (2) A protease inhibitor (PI) containing regimen: **Kaletra®**

**(lopinavir + ritonavir) + lamivudine + (zidovudine or stavudine).**

Alternative recommended NNRTI and PI regimens are detailed in the DHHS guidelines and may be indicated for certain inmates.

HIV resistance testing is not recommended for treatment-naive inmates who are being started on antiretroviral therapy. All antiretroviral medications should be initiated at full dose with the exception of those that require dose escalation that includes nevirapine, and in certain cases ritonavir plus saquinavir.

**The following antiretroviral medications should NOT be prescribed unless the inmate meets the specific exceptions noted below (Also see DHHS guidelines - TABLE 13):**

- **Specific single drug in a regimen:**
  - **hydroxyurea** (decreased efficacy/lowers CD4+ T-cells)
  - **delavirdine** (reduced efficacy)
  - **saquinavir hard gel caps (Invirase®)** - **sole PI** (↓ efficacy)
  - **efavirenz in pregnancy** (teratogenic)
  - **ritonavir as sole PI** (gastrointestinal toxicity)
  - **saquinavir soft gel capsule as sole PI** (high pill burden)
  - **amprenavir as sole PI** (high pill burden)
  - **amprenavir oral solution in pregnancy or other at-risk persons** (propylene glycol toxicity)
- **Specific two drug combinations in a regimen:**
  - **stavudine (d4T) + didanosine (ddI)** (lactic acidosis)
  - **stavudine (d4T) + zidovudine (AZT)** (antagonistic)
  - **stavudine (d4T) + zalcitabine (ddC)** (neuropathy)
  - **zidovudine (AZT) + zalcitabine (ddC)** (reduced efficacy)
  - **didanosine (ddI) + zalcitabine (ddC)** (neuropathy)
  - **nelfinavir + saquinavir** (high pill burden)
  - **atazanavir + indinavir** (worsening of hyperbilirubinemia)
  - **emtricitabine (FTC) + lamivudine (3TC)** (no benefit)
- **Complete regimens:**
  - **any monotherapy regimen** (exception: AZT monotherapy is indicated for certain pregnant women to prevent perinatal transmission)
  - **any dual therapy regimen** (exception: inmates already on a dual regimen with adequate viral suppression (HIV RNA < 50 cps/mL) can continue this treatment, but should be advised of the availability of more potent, preferred regimens)
  - **tenofovir + abacavir + lamivudine** (reduced efficacy)

- **tenofovir + didanosine + lamivudine** (reduced efficacy)
- **abacavir + lamivudine + zidovudine (Trizivir®)** (exception: inmates who are fully virally suppressed (HIV RNA < 50 cps/mL) on this easy-to-take regimen may choose to stay on this treatment, but should be provided education regarding the reduced efficacy of this regimen compared to DHHS preferred regimens.)

FDA-approved antiretroviral medications, as of December 2003, are enumerated in **Appendix 5, Nucleoside Reverse Transcriptase Inhibitors (NRTIs); Appendix 6, Nonnucleoside Reverse Transcriptase Inhibitors (NNRTIs); Appendix 7, Protease Inhibitors (PIs); and Appendix 8, Fusion Inhibitor.** Clinicians managing inmates with HIV infection should regularly review DHHS guideline appendices to keep abreast of new FDA-approved antiretroviral medications, changes in antiretroviral dosages, drug side effects and adverse reactions, monitoring parameters, and complex drug interactions.

**Monitoring Response to Initial Therapy:** Plasma HIV RNA should be measured immediately before starting antiretroviral therapy, and then 2 to 8 weeks after beginning medications, and again 3-4 months after initiating treatment. The optimal response to a HAART regimen is maximal viral suppression (< 50 cps/mL). An "ultrasensitive" HIV RNA test that detects < 50 cps/mL must be specifically ordered when assessing inmates for undetectable plasma HIV RNA. The rate of HIV RNA decline following the initiation of antiretroviral therapy and the subsequent HIV RNA level nadir strongly predict the durability of antiviral suppression and the long term effectiveness of the treatment regimen. A highly effective antiretroviral treatment regimen will roughly result in the following rate of viral suppression:

- Close to a 1 log (10-fold) decline in HIV RNA cps/mL after 1 week of treatment;
- Close to a 2 log (100-fold) decline in HIV RNA cps/mL after 4 weeks of treatment;
- Suppression to < 50 cps/mL after 4-6 months of treatment.

Failure to achieve an adequate viral response following the initiation of therapy should prompt the treating clinician to evaluate potential causes of a poor treatment response, including inadequate adherence, drug interactions that decrease antiretroviral drug levels, malabsorption of medications, or an inadequate regimen. HIV RNA levels should be repeated and a

knowledgeable physician consulted before initiating an alternative regimen.

**Immune Reconstitution:** Effective antiretroviral therapy may result in immune reconstitution with paradoxical inflammatory reactions to certain pathogens. These acute reactions can include inflammatory masses or adenitis related to *M. avium* infection, vitritis associated with CMV infection, cryptococcal meningitis, and active hepatitis C. Illnesses secondary to immune reconstitution ordinarily do not require discontinuation of antiretroviral therapy.

**Resistance Testing:** Antiretroviral drug-resistance testing is recommended on a case-by-case basis for treated inmates who have not achieved adequate viral suppression. Both genotypic and phenotypic drug-resistance assays are poorly standardized and difficult to interpret; and therefore should be ordered selectively and strategically in situations that will most likely benefit the patient. Resistance testing most reliably identifies drugs that should be avoided, rather than drugs most likely to be effective. **The need for resistance testing, the type of assay, the timing of testing, and the interpretation of the results should be determined in consultation with an infectious disease consultant or other physician with expertise in treating persons with HIV infection** and in accordance with the following guidance:

- Testing is most clearly indicated for patients who have failed previous antiretroviral therapy, not for treatment-naïve patients;
- Sufficient plasma HIV RNA must be present for testing, (e.g., at least 500 - 1,000 cps/mL, consult with laboratory conducting testing);
- Testing should be done while the patient is currently taking the antiretroviral agents that are being assessed for drug resistance;
- Testing should be considered for patients with acute HIV infection in consultation with a knowledgeable physician consultant.

**Changing Therapy:** Changing an inmate's antiretroviral drug regimen because of poor viral suppression should be approached cautiously, since retreatment options may be limited and are often less effective. Furthermore, undetectable HIV RNA levels are not achievable in certain patients. Changes in antiretroviral medications should be considered on a case-by-case

basis for inmates who have not achieved or sustained undetectable HIV RNA levels after a thorough assessment that should include the following:

**- Assess need to change regimen:**

- Review current DHHS guidelines for changing antiretroviral therapy;
- Repeat HIV RNA levels to confirm sustained elevations in HIV RNA;
- Review antiretroviral treatment history to determine if alternative drug options are feasible;
- Carefully review potential causes of virologic failure, including: lack of adherence to medication regimen, drug side effects, drug interactions, poor absorption of medications, and the development of virologic resistance (Consult with pharmacist for pharmacokinetic and adherence concerns);
- If drug toxicity is a factor in treatment failure, consider substitution of an alternative drug in the same class if HIV RNA levels were adequately suppressed with the original regimen;
- Refrain from changing antiretroviral therapy during periods of transition, such as pending release or transfer;
- Discuss with inmate his or her treatment options including the benefits and risks of changing antiretroviral therapy to determine the inmate's preference and motivation. Acute medical problems, mental health conditions, active substance abuse, and poor institutional adjustment issues, should ordinarily be addressed before initiating a new antiretroviral regimen.

**- Determine optimal new antiretroviral regimen:**

- Perform drug-resistance testing while inmate is taking failing regimen if it is determined that initiation of a new regimen is warranted at the present time;
- Identify susceptible drugs and drug classes;
- Avoid changing a single drug or adding a single drug to a failing regimen; ordinarily an entirely new regimen is

indicated;

- Avoid switching from one NNRTI to another for drug failure, or from one PI combination to another, i.e., if the initial regimen was an NNRTI regimen, switch to a PI-containing regimen and vice versa;
- Obtain recommendations from a knowledgeable physician consultant and consider drug resistance testing, (**NOTE: DHHS-funded HIV expert consultation line is 1-800-933-0440**).

**Discontinuing Therapy:** Discontinuing HAART may be an appropriate option for certain inmates, but should always be considered on a case-by-case basis.

- **Refractory patients:** Antiretroviral therapy should ordinarily not be discontinued solely because of a lack of viral suppression, since even suboptimal virologic responses to antiretroviral therapy may increase CD4+ T-cells and prevent or delay clinical progression. Continuing antiretroviral medications for terminally ill inmates, however, may provide little clinical benefit and negatively affect quality of life. In such cases, discontinuing antiretroviral therapy should be considered after thoroughly discussing treatment options with the inmate.

- **Responding patients:** Inmates who had previously begun taking HAART with CD4+ T-cells > 350/mm<sup>3</sup> might consider discontinuing antiretroviral medications to improve quality of life and avoid long term drug toxicities. DHHS guidelines, however, state that the long term benefits of discontinuing HAART in this setting are unknown. Therefore, this decision should be weighed carefully by both the inmate and the treating physician. Inmates taken off HAART should be monitored closely for viral rebound and worsening immunosuppression.

**Adverse Drug Reactions:** Antiretroviral dosing, side effects, monitoring parameters, and potential drug interactions should be carefully reviewed (See DHHS guideline appendices, <http://www.AIDSinfo.nih.gov>, prior to prescribing or changing antiretroviral therapy.) "**Black Box**" warnings and other potential serious adverse reactions to antiretroviral medications include the following:

- **Abacavir:** fatal hypersensitivity reactions with rechallenge
- **Nevirapine:** life-threatening hepatotoxicity
- **Nevirapine:** life-threatening exfoliative dermatitis
- **Nevirapine:** requires 14 day dose escalation

- **Didanosine (ddI) +/- stavudine (d4T):** pancreatitis
- **Didanosine (ddI) + stavudine (d4T):** lactic acidosis
- **Zalcitabine (ddC):** severe peripheral neuropathy
- **Zidovudine (AZT):** hematologic toxicities, e.g. severe anemia
- **Ritonavir:** marked potential for serious drug interactions
- **Efavirenz:** teratogenic
- **Efavirenz:** nightmares; abuse potential ("street value")
- **NRTIs:** lactic acidosis and severe hepatomegaly with steatosis
- **Amprenavir:** propylene glycol toxicity with oral solution if given to persons with renal/hepatic disease or pregnancy

Adverse antiretroviral drug reactions are further detailed below:

- **New onset diabetes and insulin resistance** have been associated with the **PIs**. Baseline and periodic fasting blood glucoses should be obtained to monitor inmates taking PIs. Further diagnostic studies, such as a glucose tolerance test should be pursued for inmates with borderline fasting blood glucoses. Other cardiac risk factors should be carefully assessed to gauge the risk of diabetes to the inmate's overall health. Hyperglycemia should be treated in accordance with current treatment guidelines for diabetes management. If metformin is prescribed, inmates should be monitored closely for lactic acidosis, particularly if they are taking an NRTI. The decision to switch to a non-PI containing antiretroviral regimen for inmates who develop diabetes should be made on a case-by-case basis after weighing the severity of diabetes and the overall health risks to the inmate and the potential for alternative effective antiretroviral treatment options.

- **Hyperlipidemia** with elevations in triglycerides and cholesterol are associated with **PI**-based HAART. A fasting lipid analysis should be performed prior to initiating HAART and periodically thereafter for inmates with elevated cholesterol or triglyceride levels or who have multiple cardiac risk factors. Inmates with normal lipid studies should have a fasting lipid analysis repeated annually.

Elevations in LDL-cholesterol and triglycerides should be treated in accordance with current treatment guidelines from the National Cholesterol Education Program (NCEP). Fluvastatin or pravastatin are usually the drugs of choice for treating patients on HAART with elevated LDL cholesterol levels due to their lack of serious interactions with antiretroviral medications.

- **Lactic acidosis with hepatic steatosis** is a potentially life-threatening complication associated with all **NRTIs**. Affected patients may be asymptomatic or present with nausea, vomiting,

weight loss, or dyspnea. Venous lactate levels are elevated (> 2mM). The degree of hyperlactatemia correlates with prognosis. Elevations in ALT, CPK, and amylase may also be observed. The liver biopsy shows steatosis. Treatment is discontinuation of the NRTI. Didanosine and stavudine should not ordinarily be prescribed together due to the increased risk of lactic acidosis with this NRTI combination.

- **Pancreatitis** is a potentially life-threatening complication associated with **didanosine** therapy alone or in combination with stavudine.

- **A hypersensitivity reaction** is associated with **abacavir** and is characterized by a nonspecific syndrome of fever, rash, arthralgias, cough, dyspnea, nausea, and vomiting. The hypersensitivity reaction usually occurs within 6 weeks of initiating abacavir. Restarting patients on abacavir with a history of a hypersensitivity reaction can result in a life-threatening anaphylactic reaction.

- **Nephrolithiasis and renal insufficiency** are both independently associated with the PI, **indinavir**. Toxicity is reduced by increasing fluid intake for the 3 hours following each dose of the medication.

- **Asymptomatic hyperbilirubinemia** can develop with either **indinavir** or **atazanavir** PI therapy. These two PIs should not be used in combination.

### **Complicating Co-morbid Conditions**

- **Pregnancy:** All pregnant women should be tested for HIV infection with or without known risk factors for HIV infection. The primary objective in treating pregnant women with HIV infection should be to both prevent clinical progression of HIV infection in the mother and reduce the risk of perinatal transmission to the fetus. Patient-specific antiretroviral drug therapy is ordinarily indicated for all pregnant women regardless of CD4+ T-cell count and viral load in accordance with the most recent U.S. Public Health Service treatment guidelines, accessible at <http://www.AIDSinfo.nih.gov>. Consultation with a physician with expertise in treating pregnant women with HIV infection is warranted considering the complexities of treatment decisions regarding antiretroviral selection and timing, the mode of delivery, and intrapartum care. Treatment decisions should be made on a **case-by-case basis** after a careful review of the known risks and benefits with the inmate. The following general information should be considered:

- Pregnancy, itself, does not affect progression of HIV infection;
- The risk of perinatal HIV transmission is markedly reduced with HAART therapy;
- HAART should ordinarily be considered for pregnant patients with an elevated HIV RNA level of  $> 1,000$  cps/mL. Zidovudine should be included in the HAART regimen whenever clinically feasible. Monotherapy with zidovudine should be considered for pregnant inmates with a viral load  $< 1,000$  cps/mL. Women in the first trimester of pregnancy may consider delaying antiretroviral therapy until after 10-12 weeks' gestation;
- Intravenous zidovudine is indicated during the intrapartum period in accordance with USPHS recommendations whenever possible regardless of the prenatal antiretroviral regimen;
- Cesarean section should be considered for patients with a viral load  $> 1,000$  cps/mL at the time of delivery;
- Hydroxyurea, efavirenz, or didanosine + stavudine should not be prescribed to pregnant women. Indinavir should be avoided during the third trimester due to the risk of hyperbilirubinemia in the newborn;
- Breast feeding is not generally recommended due to the risk of HIV transmission from mother to child.

#### **- Tuberculosis co-infection**

All inmates with HIV infection and unexplained pulmonary infiltrates or TB signs or symptoms should be aggressively evaluated for TB disease. Inmates with TB disease and HIV infection may present with atypical presentations of TB such as noncavitary pulmonary infiltrates or normal chest radiographs.

The drug treatment regimen for TB disease is similar for persons with or without HIV infection. Persons with HIV infection and  $< 100$  CD4+ T-cells/mm<sup>3</sup>, however do require a more intensive TB medication dosage schedule, i.e., (daily directly observed therapy for the 8-week initial phase, and either daily or thrice weekly directly observed therapy for the 18-week continuation phase of TB medications). **If the inmate with TB disease is receiving antiretroviral medications, the specific TB and antiretroviral drug regimens should be determined in consultation with a knowledgeable physician and the most recent USPHS treatment recommendations for both HIV and TB.** Rifampin

interacts with many antiretroviral medications, therefore TB and HIV medications and/or dosages often require adjustments. **(NOTE: Updated Guidelines for the Use of Rifamycins for the Treatment of Tuberculosis Among HIV-Infected Patients Taking Protease Inhibitors or Nonnucleoside Reverse Transcriptase Inhibitors, MMWR 2004;53(02):37.)**

Sputum cultures should be monitored closely to confirm the effectiveness of treatment for all patients with TB. If sputum cultures remain positive for greater than 2 months despite treatment, extended TB treatment may be warranted.

- **Hepatitis C Co-infection:** The preferred antiretroviral drug regimens for initiating therapy for HIV infection are the same for inmates with or without concurrent HCV infection. Liver transaminases should be monitored closely in inmates with HCV infection who are prescribed antiretroviral medications. The initiation of antiviral therapy for chronic hepatitis C in persons with HIV infection should be considered on an individual basis by assessing the stages of both HIV and HCV infections and weighing the potential risks and benefits of treatment. (See BOP guidelines for the management of viral hepatitis).

- **Wasting syndrome:** The CDC defines the HIV wasting syndrome as progressive, involuntary weight loss (10% reduction in baseline body weight) plus chronic diarrhea, chronic weakness, or documented fever in the absence of an explanatory concurrent illness or condition. Smaller reductions in weight (5-10%) without associated symptoms, however, may be clinically significant in persons with HIV infection, particularly when complicated by AIDS. Other potential causes of weight loss such as active TB, malignancies, drug side effects, depression, and opportunistic infections associated with AIDS should be actively identified and treated. Effective antiretroviral therapy should be initiated or improved in order to maximize HIV RNA suppression. Oral nutritional supplements do not ordinarily provide any additional benefit to a healthy diet. Other treatments, such as appetite stimulants or anabolic steroids, should be considered on a case-by-case basis. (Please see Bartlett JG, and Gallant JE, 2003 Medical Management of HIV Infection, 2003 edition, Johns Hopkins School of Medicine, for an excellent table summarizing the management of wasting syndrome.)

## **8. DOCUMENTATION**

Documentation of medical care for inmates with HIV infection should be maintained in accordance with the following:

- CDC initial and updated HIV classifications are documented

appropriately on the problem list.

- The BOP HIV Chronic Care Clinic Flowsheet is strongly recommended for tracking treatment and laboratory parameters for sentenced inmates with anticipated incarcerations of greater than 1 year.

- Treatment plans for baseline and periodic clinician evaluations should be documented in medical record progress notes.

## **9. TRANSITION TO THE COMMUNITY**

Continuity of prescribed treatments, particularly antiretroviral medications, is medically critical for inmates released directly to the community or to community placement facilities, such as halfway houses. Preparation for transitional medical needs should be initiated well in advance of anticipated release in accordance with the following guidelines:

- Release planning should be coordinated with the inmate's case manager and community corrections staff in accordance with Bureau policy.

- The inmate's primary provider or other knowledgeable health care provider should meet with the inmate to finalize the treatment plan and ensure that the inmate understands the importance of adherence to prescribed treatments and specific follow-up instructions.

- Specific efforts should be made by Bureau staff to coordinate access to federally funded drug assistance programs such as ADAP (AIDS Drug Assistance Program), and other recommended treatments such as mental health care and substance abuse programs. Consultation with MRC social workers should be pursued on a case-by-case basis to assist with release planning efforts.

- A consent for release of medical information should be obtained from the inmate in accordance with BOP policy so that the inmate's treatment plan can be discussed with the community health care provider.

- An adequate supply of medications should be provided to the inmate prior to release or during community placement in accordance with Bureau policy.

## **10. INFECTION CONTROL**

**Transmission:** HIV is spread primarily through percutaneous

blood exposures, such as injection drug use, unprotected vaginal and anal intercourse, and transfusion of contaminated blood products (received prior to 1985). HIV is also transmitted perinatally from mother to child during pregnancy and by breastfeeding. HIV is not spread by sneezing, hugging, coughing, food or water, sharing eating utensils or drinking glasses, or through casual contact.

All inmates should be counseled during orientation to the institution and when appropriate during clinical evaluations of the importance of preventing blood exposures to others during activities of daily living. The counseling message should include the following guidance:

- Do not have sex while in prison, or have unprotected sex upon release to the community;
- Do not shoot drugs;
- Do not share tattooing or body piercing equipment;
- Do not share personal items that might have your blood on them, such as toothbrushes, dental appliances, nail-grooming or clipping equipment, or razors;
- Cover you cuts and skin sores to keep your blood from contacting other persons, and report to your health care provider should you have an open, draining wound.

These messages should be reinforced for all inmates diagnosed with HIV infection. Additionally, inmates with HIV infection should be given the following guidance:

- Do not donate blood, body organs, or other tissue or semen;
- Always wash hands before eating, after touching contaminated clothing/bedding, after attending to personal hygiene, after gardening or other outdoor activities, after touching animals, or after touching any other contaminated items;
- Wash fresh fruits and vegetables thoroughly before eating;
- Avoid eating undercooked or raw meats;
- Stop smoking and do not begin smoking again upon release;
- Avoid touching stray animals.

## **Inmate Management**

Staff should manage inmates using the following infection control guidelines:

- Use correctional standard precautions when in contact with any inmate's blood or other potentially infectious materials whether or not the inmate has known HIV infection;
- Use infection control practices in which non-disposable patient-care items are appropriately cleaned, disinfected, or sterilized based on the use; and measures are taken to prevent cross-contamination during patient care; i.e., dialysis, vascular access, cauterizing, dental procedures, etc., in accordance with Centers for Disease Control Guidelines on Handwashing and Hospital Environmental Control;
- Use the appropriate airborne, droplet, and/or contact transmission precautions when indicated for immunosuppressed inmates with HIV infection who have or may have acute secondary infections transmissible by respiratory contact, or by direct hand or skin-to-skin contact.

## **11. POST-EXPOSURE MANAGEMENT**

Specific administrative, personnel, and medical procedures for implementing the CDC guidelines for HIV post-exposure prophylaxis should be outlined in the institution's exposure control plan for bloodborne pathogens. The institution's procedures for providing HIV post-exposure prophylaxis to inmate workers should be included in orientation and training.

**Evaluation and Treatment of Occupational Exposures:** Inmate workers who experience occupational-related exposures to HIV-infected blood or other potentially infectious materials (OPIM) should be provided emergent counseling and treatment with post-exposure medications when indicated, and a follow-up evaluation by a qualified health care professional should be conducted in accordance with the following guidelines:

- The injured skin or wound should be emergently cleansed with soap and running water for two minutes. Mild bleeding should be allowed to continue. Antiseptics, bleach, or other cleansing agents should not be used. Aspiration, forced bleeding, and wound incision are not recommended. Mucous membranes should be rinsed with water for two minutes. Exposed eyes should be flushed with water or saline for two minutes.
- The evaluating health care professional should interview the injured inmate worker to determine if a potential occupational exposure to body fluids that contain HIV has occurred and

determine the likelihood of HIV transmission based on the type of injury and the source(s) involved in the exposure. (**NOTE:** Blood and the following substances are considered potentially infectious for HIV: semen, vaginal secretions, cerebrospinal fluid, pleural fluid, peritoneal fluid, synovial fluid, unfixed tissue, certain lab specimens, and any substance contaminated by visible blood. Exposure to visibly uncontaminated urine, feces, and saliva does not require HIV post-exposure prophylaxis. Human bites involving blood are considered percutaneous blood exposures, however the risk of HIV transmission from these exposures is exceedingly low.) CDC guidelines require the determination of **(1)** the type of potentially infectious body fluid involved, including the amount of fluid or material and the severity of the injury, and **(2)** the infection status of the source, before deciding if PEP is indicated (See CDC guidance as summarized in **Appendix 9, HIV Post-Exposure Prophylaxis Guidelines**). Post-exposure prophylaxis is usually not indicated if the source of the exposure is not HIV-infected, unless there is evidence that the source-person had clinical evidence of HIV infection (e.g. acute retroviral illness, signs or symptoms of HIV infection) or recent high risk activity for acquiring HIV infection.

- The person whose blood or body fluids are the source of an occupational exposure should be evaluated for HIV infection in accordance with CDC guidelines and BOP policy.

- If an exposure or questionable occupational exposure to HIV has occurred, the evaluating health care professional should immediately review the incident with the Clinical Director or other physician designee to validate the exposure and determine if HIV post-exposure prophylaxis is recommended, to be considered, or is not indicated in accordance with CDC guidelines, outlined in **Appendix 9**.

- The evaluating health care professional should provide counseling to the exposed inmate worker regarding HIV post-exposure indications in accordance with BOP physician orders and CDC guidelines.

- The inmate worker should be prescribed antiretroviral medications based upon the risk assessment **as soon as possible after the exposure**. The specific antiretroviral prophylactic regimen should be determined on a case-by-case basis depending on the severity of the exposure, the potential that the source of the exposure was infected with an HIV resistant strain, and other relevant clinical factors. Consultation with a physician expert should be considered as necessary in accordance with CDC recommendations, but should not delay the initiation of prophylaxis. **Specific expert consultation is available 24 hours**

**a day, 7 days a week from the CDC hotline, (888)-448-4911.** Prior to receiving post-exposure prophylaxis, inmates workers should be counseled regarding risk, prevention, and drug treatment information such as is outlined in **Appendix 10, HIV Post-Exposure Prophylaxis Fact Sheet.**

- The provision of HIV post-exposure prophylaxis to inmates should be documented in the inmate worker's medical record, including the date and description of the exposure, counseling provided, emergency treatment rendered, and a signed informed consent or declination for emergent HIV post-exposure prophylaxis.

**Nonoccupational exposures:** Inmates who present with possible non-occupational exposures to HIV, such as unprotected sex, sharing of needles with HIV-infected persons, or exposure from other traumatic injury, should also be evaluated for post-exposure treatment, and reinforced on measures for behavioral risk reduction. Since no definitive data currently exist to support the effectiveness of post-exposure prophylaxis for specific non-occupational exposures, post-exposure prophylaxis should be considered on a case-by-case basis in these settings while considering the following factors:

- The characteristics of the reported exposure and the likelihood that the source is infected with HIV;
- The characteristics of the HIV positive source such as stage of HIV infection and viral load;
- The time delay between the exposure and presentation for medical care; and
- The willingness of the exposed inmate to adhere to the recommended antiretroviral therapy.

**Post-exposure Follow-up:** Inmates with occupational and nonoccupational exposures to HIV should have HIV antibodies measured at the time of exposure, and 6 weeks, 12 weeks, and 6 months after the exposure. Extended follow-up HIV antibody testing at 12 months is recommended for persons who become newly infected with HCV following exposure to a source coinfecting with HIV and HCV. Otherwise, a 12 month HIV antibody test is ordinarily unnecessary, but may be considered on a case-by-case basis for unique clinical situations. Direct virus assays such as HIV p24 antigen or tests that measure HIV RNA are generally not recommended, since the relative risk of false positive tests is significant. HIV antibody testing should be performed on any exposed individual who develops symptoms of an acute retroviral syndrome regardless of the time from exposure. If the source is

HIV seronegative, but engaging in behaviors at risk for transmission of HIV infection, follow-up HIV antibody testing should be considered for both the source and the exposed inmate(s).

All matters of nondisclosure/disclosure, and confidential handling of medical information pertaining to occupational and non-occupational exposure of inmates should be maintained in accordance with BOP policy.

### **ATTACHMENTS**

- Appendix 1: Baseline and Periodic Medical Evaluations for Inmates with HIV Infection
- Appendix 2: HIV Classification System (1993 CDC Criteria)
- Appendix 3: Prophylaxis for HIV-Related Opportunistic Infections
- Appendix 4: Antiretroviral Treatment Indications for HIV Infection
- Appendix 5: Nucleoside Reverse Transcriptase Inhibitors (NRTIs)
- Appendix 6: Nonnucleoside Reverse Transcriptase Inhibitors (NNRTIs)
- Appendix 7: Protease Inhibitors (PIs)
- Appendix 8: Fusion Inhibitor
- Appendix 9: HIV Post-Exposure Prophylaxis Guidelines and Definitions
- Appendix 10: HIV Post-Exposure Prophylaxis Fact Sheet
- Appendix 11: Resources
- Appendix 12: Self-Assessment: Management of HIV Infection
- Appendix 13: Self-Assessment Answers: Management of HIV Infection

## Baseline and Periodic Medical Evaluations for Inmates with HIV Infection

### Baseline Evaluation:

(1) history/PE including: funduscopy exam, PAP smear for women; (2) dental exam; (3) CBC/platelets; (4) CD4+ T-cell count, absolute and %; (5) HIV RNA (viral load); (6) serum chemistries; (7) RPR/FTA (review tx history); (8) PPD/symptom review and chest x-ray; (9) toxoplasma IgG; (10) viral hepatitis serologies; (11) pneumococcal vaccine; (12) hepatitis A and B vaccines if at-risk; (13) lipid profile prior to antiretroviral therapy.

### Periodic Evaluation:

(1) CBC/platelet count, serum chemistries - q 3-6 months on anti-retroviral tx; (2) periodic RPR as clinically indicated; (3) Pap smear - at 6 months x 1 then annually (refer to gynecologist as indicated for colposcopy ); (4) influenza vaccination annually; (5) other laboratory tests as indicated.

CD4+ T-cells/mm <sup>3</sup>	CD4+ T-cells assessment	Viral load	Clinician exam	Special Evaluations/Treatments
> 350	q 3-6 months	q 6 months off tx q 3-4 mo. on tx	q 3-6 months	Observe most inmates off therapy Consider antiretroviral tx only if viral load is markedly elevated Carefully weigh adherence issues and patient motivation prior to treating
200-350	q 3-6 months	q 3-4 months	q 3 months	Consider antiretroviral therapy unless viral load is very low
100-199	q 3-6 months	q 3-4 months	q 2 months	Initiate antiretroviral therapy regardless of plasma HIV RNA levels Initiate PCP prophylaxis
50-99	q 3-6 months	q 3-4 months	monthly	Initiate antiretroviral therapy regardless of plasma HIV RNA levels Initiate toxoplasmosis prophylaxis/maintain PCP prophylaxis Baseline funduscopy exam by eye doctor to screen for CMV
0-49	q 6 months	q 3-4 months	monthly	Initiate antiretroviral therapy regardless of plasma HIV RNA levels Maintain PCP/toxoplasmosis prophylaxis Initiate MAC prophylaxis Funduscopy exam q 6 months by eye doctor to screen for CMV

### HIV Classification System\*

CD4+ T-cells/ mm <sup>3</sup>	CD4+ (%)	A Asymptomatic	B Symptomatic Disease	C AIDS Indicator Conditions
≥ 500	≥ 29%	A1	B1	C1
200-499	14-28	A2	B2	C2
< 200	< 14	A3	B3	C3
		- acute (primary) HIV infection  - PGL (persistent generalized lymphadenopathy)	Symptomatic conditions that are attributed to HIV infection; or the conditions have a clinical course complicated by HIV.  Conditions include but are not limited to the following:  - bacillary angiomatosis - oral candidiasis - vulvovaginal candidiasis: persistent ( > 1 month or poorly responsive to tx) - cervical dysplasia (moderate-severe or CIS) - ITP - oral hairy leukoplakia - listeriosis - herpes zoster (involving more than 1 dermatome or 2 separate episodes)	- candidiasis: esophageal - coccidiomycosis: extrapulmonary - cryptococcoses: extrapulmonary - cervical cancer, invasive - cryptosporidiosis: chronic (> 1 month) - cytomegalovirus retinitis (or CMV in organs other than liver/spleen/nodes) - HIV encephalopathy - herpes simplex: esophagitis, genital/oral ulcers > 1 month - histoplasmosis: extrapulmonary/disseminated - isosporiasis: chronic diarrhea (> 1 month) - Kaposi's sarcoma - lymphoma: Burkitt's, immunoblastic, brain primary - MAC or <i>M. kansasii</i> : extrapulmonary/disseminated - <i>M. tuberculosis</i> : pulmonary or extrapulmonary - other mycobacterium: extrapulmonary/disseminated - <i>Pneumocystis carinii</i> pneumonia (PCP) - pneumonia (recurrent: 2 or more episodes within 12 months) - progressive multifocal leukoencephalopathy (PML) - salmonella septicemia (> 1 occurrence) - toxoplasmosis (CNS) - wasting syndrome secondary to HIV infection

\*1993 CDC Classification System. **NOTE:** Category B conditions take precedence over those in Category A; and Category C conditions take precedence over those in Category B. For classification purposes, the lowest accurate CD4+ T-lymphocyte count or percentage (not necessarily the most recent) should be used.

- Categories A3, B3, and C1, C2, and C3 are reported as AIDS cases.

## Prophylaxis for HIV-Related Opportunistic Infections

Pathogen	Drug	Dosage	Toxicities	Comments
<b><i>Pneumocystis carinii</i></b>  Indications:  (1) CD4+ T-cells < 200 /mm <sup>3</sup> or < 14% (2) prior PCP (3) oral candidiasis	TMP-SMX (Bactrim, Septra)  Dapsone  Pentamidine	1 SS/day <b>(1st choice)</b> 1 DS/day 1 DS 3x/week  100 mg/day; or 50 mg BID  300 mg q month aerosolized (administer by Respirgard II nebulizer)	rash/fever/nausea leukopenia/hepatitis  hemolysis methemoglobinemia  bronchospasm/cough (responds to bronchodilator tx)	prevents toxo and bacterial infections use 1 DS/day if toxo IgG+  screen for G-6-PD deficiency  obtain screening chest x-ray for TB  can stop primary and secondary PCP prophylaxis if CD4+ T-cells > 200/mm <sup>3</sup> for 3 months
<b><i>Toxoplasmosis</i></b>  Indication:  Toxo IgG+ and CD4+ T-cells: < 100 cells/mm <sup>3</sup>	TMP-SMX (Bactrim, Septra)  Dapsone + Pyrimethamine + Leucovorin	1 DS/day <b>(1st choice)</b> 1 SS/day  50 mg/day 50 mg/week 25 mg/week	rash/fever/nausea leukopenia/hepatitis  hemolysis/anemia	repeat toxo IgG if previously negative when CD4+ T-cells < 100/mm <sup>3</sup>  monitor for anemia/leukopenia with either regimen - CBC q 3-4 months  can stop primary toxo prophylaxis if CD4+ count is > 200/mm <sup>3</sup> for 3 months; can stop secondary prophylaxis if CD4+ T-cell count is > 200/mm <sup>3</sup> for 6 months
<b><i>Mycobacterium avium</i> *</b>  Indication:  CD4+ < 50 cells/mm <sup>3</sup>  *R/O disseminated MAC infection with blood culture before giving prophylaxis	Azithromycin  Clarithromycin  Rifabutin	1200 mg/week <b>(1st choice)</b>  500 mg BID  300 mg/day	nausea/vomiting  nausea/vomiting  uveitis, arthralgias hepatitis	can stop primary prophylaxis if CD4+ count is > 100/mm <sup>3</sup> for 3 months; can stop secondary prophylaxis if CD4+ count is > 100/mm <sup>3</sup> for 6 months.  Rifabutin: uveitis when given with fluconazole creates rifampin resistance review drug interactions

## Antiretroviral Treatment Indications for HIV Infection

Immune Status	Treatment Options	Comments
<p>Asymptomatic High CD4+ T-cell count</p> <p>CD4+ T-cells &gt; 350/mm<sup>3</sup></p>	<p>Defer antiretroviral tx for most inmates</p> <p>Initiate tx on case-by-case basis only for inmates with HIV RNA &gt; 55,000 cps/mL by (RT-PCR) or (bDNA)</p>	<p>Monitor HIV RNA, CD4+ T-cell count, and signs and symptoms for disease progression. Inmates with CD4+ T-cells between 350-500/mm<sup>3</sup> or significant elevations in HIV RNA, e.g. &gt; 55,000 cps/mL (RT-PCR) , should be monitored more closely.</p>
<p>Asymptomatic Depressed CD4+ T-cell count</p> <p>CD4+ T-cells 200-350/mm<sup>3</sup></p>	<p>Antiretroviral drug therapy per DHHS guidelines for most patients; some experts recommend deferring drug therapy with careful monitoring for patients with low HIV RNA, e.g. &lt; 20,000 cps/mL</p> <p>(Confirm depressed CD4+ T-cell count with second test before treating)</p>	<p>When treating, initiate HAART in accordance with current DHHS guidelines. The goal of tx is to reduce plasma HIV RNA to undetectable levels (&lt; 50 cps/mL) within 4-6 months of initiating antiretroviral treatment. Effective tx is roughly predicted by a 1 log (10 fold) decline in HIV RNA levels within 1 week, and a 2 log (100 fold) decline within 4 weeks of initiating therapy. Inmates who fail to attain undetectable plasma HIV RNA after 6 months of therapy should be reevaluated. The HIV RNA level nadir strongly predicts the durability of antiviral suppression.</p> <p><b>NOTE:</b> &gt; 90%-95% adherence to the antiretroviral tx regimen is probably necessary to achieve optimal viral suppression. Adherence improves with inmate education, simplifying pill burden/tx regimen, and effectively treating drug side effects.</p>
<p>AIDS or severe symptoms</p> <p>Asymptomatic with CD4+ T-cell count &lt; 200/mm<sup>3</sup></p> <p>HIV RNA = any value</p>	<p>Antiretroviral therapy per DHHS guidelines for all inmates</p>	<p>If the inmate has been on antiretroviral therapy in the past or requires a change in antiretroviral medications; consult with a physician with expertise in managing antiretroviral therapy.</p> <p><b>DHHS-funded expert consultation line: 1-800-933-3413</b></p>

## Antiretroviral Therapy - Nucleoside Reverse Transcriptase Inhibitors (NRTIs)

**\*Indicates Black Box Warning**

Antiretroviral Tx	Dosage	Baseline Labs	Monitoring Labs	Toxicities	Comments
<b>Zidovudine</b> (ZDV) (azidothymidine) (AZT) Retrovir  100 mg caps. 300 mg tabs. 10 mg/mL IV solution 10 mg/mL oral solution	200 mg TID or 300 mg BID  Combivir 1 BID Trizivir 1 BID  (dose adjust with severe renal or hepatic impairment or significant anemia.)	CBC/diff	CBC/diff 2,6, and 12 weeks after starting tx  every 3-4 months if stable	*granulocytopenia *anemia neutropenia myalgia *lactic acidosis *hepatomegaly *myopathy headache insomnia GI intolerance	- marrow toxicity with gancyclovir - hematologic toxicities with $\alpha$ -interferon - reduce dose for moderate toxicities - good CNS penetration  - with 3TC as Combivir - with 3TC and abacavir as Trizivir  - do not use with stavudine (d4T) (antagonizes)
<b>Lamivudine</b> (3TC) Epivir  150, 300 mg tablets 10 mg/mL solution	150 mg BID or 300 mg daily  Combivir 1 BID Trizivir 1 BID  (adjust dose in renal impairment)	none	none	*lactic acidosis *hepatomegaly	- with ZDV as Combivir - with ZDV and abacavir as Trizivir - do not administer with zalcitabine, sulfamethoxazole/trimethoprim (1 lamivudine AUC 44%)
<b>Stavudine (d4T)</b> Zerit, Zerit XR  15, 20, 30, 40 mg capsules 37.5, 50, 75, 100 mg extended release capsules 1 mg/mL (reconstituted) powder for oral solution	$\geq 60$ kg: 40 mg BID < 60 kg: 30 mg BID  Zerit XR: $\geq 60$ kg: 100 mg QD < 60 kg: 75 mg QD  (adjust dose in renal impairment and peripheral neuropathy if alternate regimen is not suitable)	CBC/diff	CBC/diff	neuropathy (dose related) *lactic acidosis *hepatomegaly * pancreatitis lipodystrophy neuromuscular weakness (rare)	- NRTI with highest probability of lactic acidosis  - do not use with zidovudine (antagonistic)  - do not use with ddI or ddC (overlapping toxicities, lactic acidosis)

<b>Didanosine (ddI)</b> Videx Videx EC  25, 50, 100, 150, 200 mg chewable, dispersible, buffered tabs  125, 200, 250, 400 mg EC capsules  100, 167, 250 mg powder for oral solution, buffered, in single-dose packets	<p>≥ 60kg: 400 mg QD (buffered tabs or enteric coated cap); or 200 mg BID (buffered tabs); oral powder: 250 mg BID</p> <p>&lt; 60kg: 250 mg QD (buffered tabs or enteric coated cap); or 125 mg BID (buffered tabs); oral powder: 167 mg BID</p> <p>(adjust dose for renal impairment)</p> <p><b>Take on empty stomach</b></p> <p>For once or twice daily regimens, patients must take 2 to 4 of the appropriate strength buffered tablets to ensure adequate buffering and avoid didanosine degradation; 200mg tablets should only be used in once daily dosing regimen.</p>	CBC/diff amylase liver function	CBC/diff amylase/liver function tests with GI symptoms	diarrhea nausea *pancreatitis neuropathy *lactic acidosis *hepatomegaly retinal changes optical neuritis	<ul style="list-style-type: none"> <li>- do not prescribe with history of pancreatitis or hx of alcohol abuse</li> <li>- adjust dose in renal/hepatic disease</li> <li>- multiple drug interactions when using buffered ddI: e.g., tenofovir, IDV, RTV, methadone, allopurinol, ganciclovir.</li> <li>- Videx EC does not have buffer</li> <li>- periodic retinal exams recommended</li> <li>- do not give with ddC or ddI (overlapping toxicities)</li> </ul>
<b>Zalcitabine (ddC)</b> HIVID  0.375, 0.75 mg tablets	0.75 mg q8h  (reduce dose for renal disease)	CBC/diff	CBC/diff amylase with GI symptoms	*neuropathy (dose related) stomatitis * pancreatitis *lactic acidosis	<ul style="list-style-type: none"> <li>- reduce dose for renal disease</li> <li>- do not give with lamivudine</li> <li>- do not give with ddI or d4T (overlapping toxicities)</li> </ul>

<b>Abacavir</b> (ABC) Ziagen  300 mg tablets 20 mg/mL oral soln.	300 mg BID	none	none	*hypersensitivity reaction (fever, rash, GI symptoms) *lactic acidosis *hepatomegaly Report hyper- sensitivity syndrome cases to Abacavir Hypersensitivity Registry at 1-800-270-0425	- <b>DO NOT restart abacavir following a hypersensitivity reaction!</b>  - alcohol ↑ abacavir AUC  - combined with 3TC and ZDV as Trizivir
<b>Emtricitabine</b> (FTC)  Emtriva  200 mg caps	200 mg QD  (adjust dose in renal impairment)	none	none	*lactic acidosis *hepatomegaly headache nausea rash hyperpigmentation	- hyperpigmentation, especially on palms and soles of feet
<b>Tenofovir</b> (PMPA) Viread  300 mg tablets	300 mg once daily for patients with creatinine clearance ≥ 60 mL/min  (adjust dose in renal insufficiency)	transaminases creatinine / clearance if abnormal	transaminases CPK	*lactic acidosis *hepatomegaly nausea/vomiting diarrhea flatulence renal insufficiency (rare)	- take without regard to meals  - primarily excreted by the kidneys; watch for co-administered drugs that may compete/affect renal elimination

- Review updated antiretroviral drug information/interactions from DHHS guidelines; dosage adjustments frequently required depending on drug regimen

**\*Indicates Black Box Warning**

## Antiretroviral Therapy - Non-nucleoside Reverse Transcriptase Inhibitors (NNRTIs)

Antiretroviral Tx	Dosage	Baseline Labs	Monitoring Labs	Toxicities	Comments
<b>Efavirenz</b>  Sustiva  50, 100, 200 mg capsules  600 mg tablets	600 mg daily  <b>on empty stomach,</b> preferably HS	CBC liver transaminases	CBC transaminases cholesterol	dizziness psychiatric symptoms hallucinations nightmares mild rash fetal anomalies ↑ transaminases	<b>- teratogenic</b> - multiple drug interactions: do not give with cisapride, midazolam, triazolam, ergot derivatives, and others  - false + preliminary cannabinoid test - not false + on confirmatory test  - abuse potential (“street value”)
<b>Nevirapine (NVP)</b> Viramune  200 mg tablets 50 mg/5mL oral suspension	<b>dose escalation required:</b>  200 mg tabs one daily for 14 days, then to 200 mg BID	CBC liver transaminases	transaminases	*hepatotoxicity rash, including severe reactions such as *Stevens-Johnson syndrome	- rash reduced by gradual dose escalation when drug is stopped; restart at 200 mg daily for 14 day lead-in period; higher incidence of rash than other NNRTIs  - take without regard to meals
<b>Delavirdine (DLV)</b> Rescriptor  100, 200 mg tablets  Nonformulary	400 mg TID 4 x 100 mg tabs may be dispersed in ≥ 3 oz. water; 200 mg tabs must be taken intact  separate buffered preparations dosing with ddI or antacids by 1 hour	CBC liver transaminases	CBC transaminases	rash neutropenia with nelfinavir headache ↑ transaminases	- multiple drug interactions: review all drugs; serious toxicities with cisapride, terfenadine, astemizole; absorption decreased with antacids  - administer ddI one hour after delavirdine  - take without regard to meals

- Non-nucleoside analogues should never be prescribed in combination with one another.
- Review updated antiretroviral drug information/interactions from DHHS guidelines; dosage adjustments frequently required depending on drug regimen

\* **Indicates Black Box Warning**

## Antiretroviral Therapy - Protease Inhibitors (PIs)

Antiretroviral Tx	Dosage	Baseline Labs	Monitoring Labs	Toxicities also see footnotes	Comments
<b>Nelfinavir</b> (NFV) Viracept  250 mg tabs. 625 mg tabs 50 mg/g oral powder - contains phenylalanine	750 mg TID; OR 1250 BID when used as sole PI  (Tablets may be dissolved in small amount of water)	transaminases glucose lipid profile	every 3-4 months: transaminases glucose  lipids as needed	diarrhea ↑ transaminases	- take with snack or with meal  - multiple drug interactions as with other PIs: do not coadminister with terfenadine, astemizole, cisapride, rifampin, triazolam, midazolam, and others.  - administer nelfinavir 1 hour after ddI
<b>Indinavir</b> (IDV) Crixivan  200, 333, 400 mg capsules	800 mg q 8 h when used as sole PI  (Various dosaging options when given with ritonavir: consult with experienced clinician to determine optimal regimen for specific patient)	transaminases renal function glucose lipid profile	every 3-4 months: transaminases renal function glucose  lipids as needed	kidney stones nausea vomiting dry skin alopecia hemolytic anemia  NOTE: increased bilirubin usually not clinically significant	- take 1 hr before or 2 hrs after meal; may take with skim milk, or low fat meal  - multiple drug interactions as with other PIs  - administer ddI 1 hour after indinavir
<b>Ritonavir</b> (RTV) Norvir  100 mg capsules  600 mg/7.5 mL solution	600 mg BID when used as sole PI.  (adjust dose when used to enhance PI levels)  When initiating as sole PI - escalate as follows:  300 mg BID (day 1-2) 400 mg BID (day 3-5) 500 mg BID (day 6-13) 600 mg BID	transaminases glucose lipid profile CPK uric acid	every 3-4 months: transaminases renal function glucose  CPK uric acid lipids as needed	nausea vomiting abdominal pain taste perversion paresthesias lipid disorders	- take with food - <b>*multiple drug interactions:</b> potential for very serious adverse events when coadministered with certain non-sedating antihistamines, sedative hypnotics, anti-arrhythmics, or ergot alkaloids.  - refrigerate capsules; capsules stable at room temp. for up to 30 days; oral solution should not be refrigerated  - PI strongly correlated with lipid abnormalities  - <b>dose separately from ddI by 2 hours</b>
<b>Saquinavir</b> (SQV) Fortovase (soft-gel) 200 mg capsules  Invirase (hard-gel) 200 mg capsules	<u>Fortovase</u> 1200 mg TID  <u>Invirase</u> is NOT recommended as sole PI in any regimen.; with ritonavir: ritonavir 400 mg BID + Invirase 400 mg BID	transaminases glucose lipid profile	every 3-4 months: transaminases glucose  lipids as needed	diarrhea nausea abdominal discomfort dyspepsia headache	- take Fortovase with large meal - use Fortovase capsules within 3 months after removed from refrigeration  - avoid coadministration with cisapride, triazolam, midazolam and ergot derivatives  - do not use saquinavir (Invirase) HGC (hard-gel capsule) without ritonavir

<b>Amprenavir</b> (APV) Agenerase  50, 150 mg capsules 15 mg/mL oral solution  NOTE: capsules and oral solution not interchangeable on mg per mg basis  Use oral solution only when amprenavir caps. cannot be used	> 50 kg: <u>caps:</u> 1,200 mg BID; <u>oral sol:</u> 1,400 mg BID  < 50 kg: <u>caps:</u> 20 mg/kg BID, max: 2400 mg daily; <u>oral soln:</u> 1.5mL/kg BID, max 2800 mg daily.  ( <u>adjust dosage</u> when using with low dose ritonavir and in hepatic insufficiency)	transaminases glucose fasting lipid profile	every 3-4 months: transaminases glucose	rash GI intolerance perioral paresthesias ↑ transaminases	- avoid administration with high fat meals - do not coadminister with astemizole, bepridil, cisapride, dihydroergotamine, ergotamine, midazolam, triazolam, rifampin - severe drug interactions - possible cross-sensitivity with sulfonamides - take 1 hour before or after antacids or ddi - many patients can continue/restart amprenavir if rash is mild to moderate - <b>*oral solution contains propylene glycol - contraindicated in pregnant women and in patients with hepatic or renal failure, and in patients treated with disulfiram or metronidazole</b>
<b>Fosamprenavir</b>  Lexiva   700 mg tabs (equivalent to 600 mg amprenavir)	<u>PI-experienced pts:</u> 700 mg BID plus 100 mg ritonavir BID (caps)  <u>Therapy-naïve pts:</u> 1400 mg BID without ritonavir; OR  1400 mg QD plus 200 mg ritonavir QD; OR 700 mg BID plus 100 mg ritonavir BID  increase ritonavir dose to 300 mg total per day if efavirenz is given with fosamprenavir and ritonavir	transaminases glucose fasting lipid profile	transaminases glucose every 3-4 months	nausea / vomiting rash diarrhea headache fat redistribution acute hemolytic anemia	- converted to amprenavir - possible cross-sensitivity to sulfonamides - exercise caution when administering to inmates with liver dysfunction - coadministration with the following is contra-indicated: ergot derivatives, cisapride, pimoziide, midazolam, or triazolam; if coadministered with ritonavir, then flecainide and propafenone are also contraindicated - very serious drug interactions can occur between fosamprenavir and amiodarone, lidocaine (systemic), quinidine, or TCAs - monitor drug levels of these agents if given concomitantly
<b>Lopinavir + Ritonavir</b> (LPV/RTV) Kaletra  caps: 133.3 mg LPV + 33.3 mg RTV oral soln, per mL: 80 mg LPV + 20 mg RTV	400/100 mg (3 capsules) bid (lopinavir/ritonavir)  (consider dosage adjustment if used with efavirenz or nevirapine)  *** oral soln contains 42% alcohol.	transaminases glucose cholesterol triglycerides	transaminases glucose cholesterol triglycerides	pancreatitis diarrhea (mild) asthenia nausea headache ↑ transaminases	- take with food - refrigerated capsules remain stable at room temperature for 2 months - multiple drug interactions - do not coadminister with flecainide, propafenone, dihydroergotamine, ergonovine, ergotamine, methylethylergonovine, pimoziide, midazolam, triazolam - concomitant ddi: take ddi 1 hour before or 2 hours after Kaletra
<b>Atazanavir</b> (ATV) Reyataz  100, 150, 200 mg caps	400 mg QD with food  if taken with efavirenz (or tenofovir), give atazanavir 300 mg with ritonavir 100 mg QD  (adjust dose in hepatic impairment)	transaminases glucose  fasting lipid profile	every 3-4 months: transaminases glucose  lipids as needed	P-R interval prolongation headache nausea rash	- take with food  - when coadministered with didanosine buffered formulations, give atazanavir (with food) 2 hours before or 1 hour after didanosine.  - multiple drug interactions as with other PIs - use with caution in inmates with conditions or concomitant medications that can cause P-R prolongation

- Protease inhibitors may have serious interactions with certain drugs metabolized by the liver, e.g. astemizole, cisapride; **review drug interactions carefully.**

- Protease inhibitors may cause hyperglycemia, diabetic ketoacidosis, elevated transaminase levels, lipid abnormalities, and fat redistribution. PIs may also increase bleeding in patients with hemophilia.

**\*Indicates Black Box Warning**

## Antiretroviral Therapy - Fusion Inhibitor

Antiretroviral Tx	Dosage	Baseline Labs	Monitoring Labs	Toxicities	Comments
<b>Enfuvirtide</b>  Fuzeon   single use vial: lyophilized powder for injection - delivers approx 90 mg/mL when reconstituted with 1.1 mL of sterile water for injection   Nonformulary	90 mg (1 mL) subcutaneously BID			hypersensitivity reactions diarrhea nausea fatigue local inj site reactions (pain, erythema, induration, nodules and cysts, pruritus, ecchymosis)  ↑ rate of bacterial pneumonia	- store at room temperature  - reconstituted solution should be refrigerated and used within 24 hours

## HIV Post-exposure Prophylaxis (PEP) Guidelines\*

TYPE OF INJURY	Exposure Type (severity)	HIV INFECTION STATUS OF SOURCE (class/viral load)**				COUNSEL  Based on any one X:  (no. of PEP drugs)	TREATMENT REGIMEN  (Base treatment on resistance patterns, and if needed, obtain consult)
		<i>low</i>	<i>high</i>	<i>unknown status or source</i>	<i>HIV(-)</i> No PEP		
Needle stick (i.e. puncture, or percutaneous)	Deep or more severe	X	X	X		Recommend (3)  Generally NO PEP, however, consider (2)	▶ <b>EXPANDED:</b> BASIC 2 drug regimen plus 1 of the following ( <i>NFV or EFV or IDV or ABC</i> ) ▶ <b>BASIC 2</b> - drug regimen: ( <i>ZDV + 3TC</i> ); or ( <i>d4T+3TC</i> )
Needle stick OR Mucous membrane ( <i>splash, spray</i> ) OR Open, compromised skin, i.e. <i>dermatitis, chapped, abrasion, open wound, bites</i> )	Superficial/ less severe OR large volume of a blood splash	X	X	X		Recommend (3)  Recommend (2)  Generally NO PEP, however, consider (2)	▶ BASIC 2 + 1 EXPANDED (above) ▶ BASIC 2-drug regimen (above) ▶ BASIC 2-drug regimen (above)
Mucous membrane ( <i>splash, spray</i> ) OR Open, compromised skin exposures*** <i>defined above, bites.</i>	Small volume or few drops	X	X	X		Recommend (2)  Consider (2)  Generally NO PEP, however, consider (2)	▶ BASIC 2-drug regimen (above) ▶ BASIC 2-drug regimen (above) ▶ BASIC 2-drug regimen (above)

\* Adapted from CDC guidelines: MMWR, Vol. 50 (RR-11) June 29, 2001; **Consult hotline for latest information on PEP - 1-888-448-4911**

\*\* If the source has known HIV infection, PEP is recommended or considered based on type of injury and infection status of the source (low viral load is < 1,500 cps/mL or asymptomatic HIV infection and high viral load is > 1,500 cps/mL or AIDS); If the infection status of source is unknown PEP is usually not indicated, but can be considered; if the source is HIV seronegative, PEP is not warranted.

\*\*\* For skin exposures, follow-up is indicated with open, compromised non-intact skin resulting in bloodborne/other potentially infectious material (OPIM) exposure to either person. Otherwise, no PEP is warranted. OPIM includes: semen, vaginal secretions; and CSF, synovial, pleural, peritoneal, pericardial, and amniotic fluids.

## HIV Post-exposure Prophylaxis (PEP) - Definitions

### INJURY TYPE

- (1) Needle stick, puncture or percutaneous injury, i.e. contaminated needle or sharp instrument that penetrates or cuts the skin.
- (2) Mucous membrane is a splash or spray of blood or OPIM into the eyes, nose, ear, mouth; or that inoculates into compromised, open skin.
- (3) Open, compromised skin exposures without barrier protection that has resulted in direct exposure to blood/OPIM, should be clinically evaluated. For human bites, include the possibility that both the person bitten and the person who inflicted the bite were exposed to bloodborne pathogens/OPIM. Transmission of HBV or HIV infection has only rarely been reported by this route.

### EXPOSURE TYPE (SEVERITY FACTOR)

- (1) More severe or deep: large-bore hollow needle, deep puncture, visible blood on device, or needle used in patient's artery or vein.
- (2) Superficial or less severe: solid needle or superficial scratch injury.
- (3) Large volume is a major blood volume
- (4) Small volume is a few drops.

### HIV INFECTION STATUS OF SOURCE

- (1) Low viral load or HIV-Positive CLASS I: asymptomatic or viral load is < 1,500 RNA cps/mL.
- (2) High viral load or HIV-Positive CLASS II: asymptomatic HIV infection, AIDS, acute seroconversion, or viral load is > 1,000 RNA cps/mL.
- (3) Source of unknown HIV status: i.e. deceased, or person refuses testing, or no samples available; consider clinical assessment & risk behaviors.
- or Unknown source: i.e. exposure from inappropriately disposed blood; from a sharp container; consider the infection among the patient setting.

### COUNSEL

- (1) Recommend: means the exposure represents an increased risk of transmission could take place and the use of PEP is recommended.
- (2) Consider: means PEP is optional: an individualized "decision" is made between the exposed person and provider. If PEP is initiated and the source is later determined to be HIV-negative, PEP should be discontinued.
- (3) Generally none: means no PEP is warranted; however in settings where exposure to HIV-infected persons is likely, PEP should be considered.
- (4) None indicated: No PEP is warranted when the source is HIV negative (-).

**TREATMENT:** PEP tx is **4 weeks** (at least 28 days) of **2 or 3** oral drugs: (1) **Basic 2-drug PEP** = ZDV + 3TC ; or d4T+3TC; or base tx on resistance patterns. If resistance, obtain ID consult. (2) **3-drug PEP** = Basic 2-drug combination + (*NFV*, or *IDV* or *EFV* or *ABC*) , or base tx on resistance patterns. Drug toxicity monitoring: CBC and renal and hepatic function tests at baseline and 2 weeks after starting PEP.

**MEDICATIONS/DOSING:** **Zidovudine (ZDV)** = 600 mg per day in two or three divided doses, **Lamivudine (3TC)** = 150 mg BID; **Stavudine (d4T)** = > 60 kg: 40 mg BID, or < 60 kg: 30 mg BID; **Indinavir (IDV)** = 800 mg every 8 hours on empty stomach; **Efavirenz (EFV)** = 600 mg daily at bedtime; **Abacavir (ABC)** = 300 mg BID; **Nelfinavir (NFV)** = 750 mg TID with food, or 1250 mg twice daily.

## **HIV Post-exposure Prophylaxis Fact Sheet**

**Question #1** - What is my risk of acquiring HIV infection following an exposure?

**Answer:** The risk of acquiring HIV infection is related to the type and severity of exposure to blood or other potentially infectious body fluids that include: semen, cerebrospinal fluid, pleural fluid, peritoneal fluid, vaginal secretions, pericardial fluid and amniotic fluid. The average risk of acquiring HIV infection following an exposure from a puncture or cut in the skin is 0.3% (3 out of 1,000). The risk increases with the depth of the injury, if visible blood was present on the device causing the injury, if the device was previously in a patient's vein or artery, or if the source of the exposure was a person with AIDS. The risk of acquiring HIV infection after the exposure of mucous membranes of the eyes, nose, or mouth to HIV-infected material is 0.09% (less than 1 out of a thousand). The risk of acquiring HIV infection after the exposure of intact skin to HIV-infected material is less than 0.09% (The risk may be increased if the skin is not intact, or there is prolonged exposure with a large amount of blood). Every potential exposure should be discussed with a health care provider so that the specific risks of the particular exposure can be reviewed and assessed.

**Question #2** - If I acquire HIV infection, can I be cured?

**Answer:** Presently there is no cure for HIV infection. Nearly all persons infected with HIV develop the acquired immunodeficiency syndrome (AIDS). Current treatments approved by the Food and Drug Administration for HIV infection markedly prolong life and delay the progression to AIDS, but have not been proven to completely eradicate HIV. Prevention of HIV infection is critical.

**Question #3** - If I have been exposed to HIV, what can I do to prevent infection?

**Answer:** Studies of health care workers exposed to HIV indicate that the medication zidovudine (AZT), can reduce the transmission of HIV infection following an occupational exposure by nearly 80%. The Centers for Disease Control and Prevention (CDC) recommends that persons at risk for acquiring HIV infection through occupational exposures to blood or other potentially infectious fluids be evaluated for preventive therapy. Treatment consists of taking 2 or 3 drugs effective against HIV for one month. The medications should be started as soon as possible following an exposure. The decision to recommend preventive therapy is determined on a case-by-case basis while assessing both the severity of the exposure and the infection status of the source of the exposure.

**Question #4** - If I have been exposed to urine, feces, or saliva from a person with HIV infection

or AIDS should I take prophylactic medication?

**Answer:** The CDC does not recommend prophylactic treatment for HIV infection following occupational exposure to urine, feces, or saliva unless these substances are visibly contaminated with blood.

**Question #5** - Do the preventive medications have harmful side effects?

**Answer:** The drugs may have significant side effects that have been documented primarily in persons with HIV infection (see below). Drug toxicities can be exacerbated by drug interactions. If you are currently taking prescribed medications for other health reasons you should review potential drug interactions and toxicities with your physician. You should have blood tests to evaluate your blood count, and kidney and liver function to screen for possible drug side effects.

### **Prophylactic Antiretroviral Medications**

***Zidovudine (Retrovir) (AZT)*** - headache, muscle pains, nausea, sleeping problems, anemia

***Lamivudine (Epivir) (3TC)*** - minimal symptoms

***Stavudine (Zerit) (d4T)*** - nausea, vomiting, abdominal pain, fatigue, tingling in hands and feet, burning or pain in the extremities

***Indinavir (Crixivan) (IDV)*** - nausea, vomiting, diarrhea, high blood sugar (diabetes), kidney stones; (take on empty stomach or with light snack and drink six 8 oz. glasses of water every day; avoid taking with grapefruit juice which decreases drug levels)

***Efavirenz (Sustiva) (EFV)*** - dizziness, insomnia, sleepiness, memory loss, agitation, hallucinations, skin rashes, headache, fatigue, nausea, vomiting, diarrhea, numbness or tingling (take on empty stomach at bedtime)

***Abacavir (Ziagen) (ABC)*** - nausea, fatigue, headache, vomiting, diarrhea, loss of appetite, (do not restart after stopping for drug side effects without discussing with health care provider)

***Nelfinavir (Viracept) (NFV)*** - diarrhea, nausea, gas, rash, high blood sugar (diabetes)

**Question #6** - Can I take preventive medications for HIV following an exposure if I am pregnant?

**Answer:** Pregnancy itself should not preclude post-exposure prophylaxis, however, the known and unknown potential toxicities of antiretroviral medications on the mother, fetus, and newborn child should be discussed carefully with your physician. Pregnancy testing is recommended if you are of childbearing age, do not know if you are pregnant and/or have reason to believe you may be pregnant. Zidovudine (AZT) use in the second and third trimesters of pregnancy and early infancy has not been associated with serious adverse effects for the mother or her infant. Efavirenz is not recommended for pregnant women due to fetal anomalies in treated animals. Stavudine and didanosine in combination should be avoided because of lactic acidosis reported in pregnant women taking these drugs. Indinavir should not be administered to pregnant women shortly before delivery because of potential hyperbilirubinemia in the newborn.

**Question #7** - How will I know if I have been infected or protected from infection with HIV?

**Answer:** Your health care provider will measure your blood for HIV antibodies at the time of exposure, and roughly at 6 weeks, 12 weeks, and at 6 months. If you do not develop HIV antibodies by 6 months you are most likely not infected with HIV. In certain cases, your health care provider may measure HIV antibodies at 12 months as an extra precaution.

**Question #8** - Do I need to take any precautions during the 6 months I am awaiting confirmation that I have not newly acquired HIV infection while in prison or after release?

**Answer:** Yes. You should consider the following recommendations and maintain these precautions until advised that they are no longer necessary by your physician:

1. Report any unusual symptoms to your physician including fever, swollen glands, rash, or any new severe illness.
2. Avoid exposing others to your blood or other potentially infectious body fluids. Use condoms during sexual intercourse. Do not share needles, razors, toothbrushes or other items that may be contaminated with your blood.
3. Use birth control measures to prevent pregnancy.
4. Consider discontinuing breastfeeding.
5. Do not donate blood, sperm, or other potentially infectious body substances.

## Resources

**1. Department of Health and Human Services/U.S. Public Health Service - [www.AIDSinfo.nih.gov](http://www.AIDSinfo.nih.gov).** Website provides quick access to **DHHS treatment guidelines, AIDS Education and Training Centers**, and information on new antiretroviral drugs, vaccines, and clinical trials.

- **Consultant line: 1-800-933-3413** - (federally-funded consultation line for providers)
- **PEP hotline: 1-888-448-4911** - (federally-funded 24 hour hotline for post-exposure prophylaxis consultation)

**2. Centers for Disease Control and Prevention, Division of HIV/AIDS Prevention website for patient education on the “Prevention of Opportunistic Infections.” - [www.cdc.gov/hiv/dhap.htm](http://www.cdc.gov/hiv/dhap.htm)** (see brochures).

**3. Johns Hopkins AIDS Service - [www.hopkins-aids.edu](http://www.hopkins-aids.edu)**  
Website provides frequent updates on latest clinical news in HIV management.

## Self Assessment: Management of HIV Infection

### Question #1

An inmate with a history of cerebral toxoplasmosis with a CD4<sup>+</sup> count of 50/mm<sup>3</sup> is started on AZT/3TC/efavirenz. One year later he is asymptomatic with a CD4<sup>+</sup> T-cell count of 500/mm<sup>3</sup>. Which of the following is true?

- A. The inmate should remain classified as C3
- B. The inmate should be reclassified to A2
- C. The inmate should be reclassified to B2
- D. The inmate should be reclassified to C2
- E. The inmate should be reclassified to A3

### Question #2

Which of the following conditions may indicate underlying HIV infection?

- A. Lymphadenopathy and fever
- B. Herpes zoster (shingles)
- C. Severe seborrhea
- D. Oral thrush
- E. All of the above

### Question #3

Which of the following is not indicated for a baseline evaluation of an inmate with HIV infection?

- A. Chest radiograph
- B. Plasma HIV RNA testing
- C. Anergy panel
- D. Vaccination against pneumococcal pneumonia
- E. Toxoplasma IgG titer

### Question #4

Which statement is false regarding the initiation of prophylaxis for opportunistic infections associated with HIV?

- A. Primary PCP prophylaxis is indicated if CD4<sup>+</sup> T-cells are < 200/mm<sup>3</sup>.
- B. Primary toxoplasmosis prophylaxis may be indicated if CD4<sup>+</sup> T-cells are < 100/mm<sup>3</sup>.
- C. Primary *Mycobacterium avium* prophylaxis is indicated if CD4<sup>+</sup> T-cells are < 50/mm<sup>3</sup>.
- D. Primary CMV prophylaxis is indicated with +CMV IgG titers and if CD4<sup>+</sup> T-cells are < 50/mm<sup>3</sup>.

**Question #5**

Which of the following statements is false regarding prophylaxis of opportunistic infections associated with AIDS?

- A. The agent of choice for preventing *Mycobacterium avium* infection is weekly azithromycin.
- B. The agent of choice for preventing PCP is trimethoprim-sulfamethoxazole.
- C. Primary prophylaxis for PCP, toxoplasmosis encephalitis, and *Mycobacterium avium* infection can be discontinued if CD4+ T-cells increase significantly.
- D. Isoniazid should be continued after treatment of active TB to prevent relapse.

**Question #6**

Which of the following is false regarding antiretroviral therapy?

- A. Antiretroviral therapy is indicated for persons with AIDS.
- B. Strict adherence to treatment is essential to achieve long term viral suppression.
- C. Persons who have used illicit drugs in the past are almost always nonadherent.
- D. Persons with a CD4+ T-cell count of  $550/\text{mm}^3$  and a viral load of 10,000 cps/mL ordinarily should not be started on antiretroviral therapy.
- E. A depressed person is more likely to be nonadherent to medications.

**Question #7**

Which of the following antiretroviral medications should ordinarily not be prescribed?

- A. Hydroxyurea
- B. Hard gel saquinavir (Invirase<sup>®</sup>) as sole protease inhibitor
- C. Didanosine (ddI) in combination with stavudine (d4T)
- D. Delavirdine
- E. All of the above

**Question #8**

Which of the following drug regimens is most preferred based on efficacy and safety profiles?

- A. Tenofovir + lamivudine (3TC) + abacavir
- B. Zidovudine (AZT) + lamivudine (3TC) + efavirenz
- C. Zidovudine (AZT) + stavudine (d4T) + efavirenz
- D. Didanosine (ddI) + stavudine (d4T) + nevirapine
- E. Zidovudine (AZT) + lamivudine (3TC) + saquinavir

**Question #9**

Which of the following are potentially life threatening complications of antiretroviral therapy?

- A. Restarting Abacavir in a patient who stopped taking the drug because of fever and rash.
- B. Continuing zidovudine (AZT) in an inmate with lactic acidosis.
- C. Hepatic necrosis from nevirapine
- D. Pancreatitis from didanosine (ddI)
- E. All of the above

**Question #10**

Which of the following statements is false regarding the management of pregnant women with HIV infection?

- A. Most pregnant women with HIV infection should not receive antiretroviral medications.
- B. Efavirenz and hydroxyurea are potentially teratogenic.
- C. Cesarean section reduces perinatal transmission of HIV infection.
- D. HIV can be transmitted from an infected mother to her newborn infant by breast feeding.

**Question #11**

Which of the following statements is false?

- A. Inmate workers who have percutaneous exposures to HIV contaminated blood are candidates for emergent post-exposure prophylaxis with antiretroviral medications.
- B. The risk of acquiring HIV infection after a single percutaneous exposure to HIV-infected blood is on average 3 in a 1,000.
- C. Antiretroviral medications rarely cause side effects when given as prophylaxis to uninfected persons with HIV.
- D. Baseline testing for HIV infection in the exposed inmate worker is indicated at the time of exposure.

**Question #12**

Pulmonary TB in a person with HIV infection can present with which of the following chest radiograph findings?

- A. Normal chest radiograph
- B. Bilateral cloudy infiltrates
- C. Upper lobe infiltrates
- D. Large cavity
- E. All of the above

## Self Assessment Answers: Management of HIV Infection

### Question #1 - Answer is A

HIV classification is based on clinical symptoms, specific diagnoses associated with HIV infection, and the CD4+ T-cell count and percentage. A person with a CD4+ T-cell count below 200 cells/mm<sup>3</sup> **or** < 14% with an AIDS indicator condition is classified as **C3**. Reclassification is indicated only when an inmate progresses to a more advanced stage of HIV infection, not with clinical or immunologic improvements.

### Question #2 - Answer is E

HIV infection should be considered in the differential diagnosis of patients presenting with relatively common medical conditions, including fever of unknown etiology, oral thrush, unexplained rash, severe seborrhea, lymphadenopathy, and herpes zoster or shingles.

### Question #3 - Answer is C

All inmates diagnosed with HIV infection should have a baseline evaluation by a clinician that includes a history and physical, laboratory tests, and immunizations. Anergy testing is not recommended because of poor standardization of testing antigens and the failure of anergy testing to reliably predict tuberculin skin test reactivity.

### Question #4 - Answer is D

Primary prophylaxis for opportunistic infections for persons with HIV infection is based on the degree of immunosuppression as determined by CD4+ T-cell levels, independent of plasma HIV RNA levels. Primary prophylaxis with gancyclovir for CMV retinitis is not routinely recommended, since prophylactic gancyclovir does not improve patient survival, may promote CMV resistance, and requires a large pill burden for the patient.

### Question #5 - Answer is D

Specific prophylaxis regimens for HIV-related opportunistic infections are enumerated in Appendix 3. USPHS guidelines recommend discontinuing primary prophylaxis for PCP, toxoplasmosis, and *Mycobacterium avium* infections for persons responding to effective antiretroviral treatment with sustained elevations in CD4+ T-cells. Persons with HIV infection and active TB do not require isoniazid following the successful completion of multi-drug therapy for TB disease.

### Question #6 - Answer is C

Antiretroviral therapy is indicated for persons with HIV infection with AIDS or severe symptoms of AIDS. The optimal time to initiate antiretroviral therapy in asymptomatic patients with HIV infection is uncertain. The decision to initiate treatment is largely dependent on the degree of immunosuppression and viral load. Inmates with a CD4+ T-cell count > 350/mm<sup>3</sup> and a low viral load < 55,000 cps/mL ordinarily should not be started on antiretroviral therapy. All inmates should be evaluated and counseled carefully before initiating antiretroviral therapy, since strict adherence (> 90% - 95%) to medications is necessary to achieve long term viral

suppression. Gender, race, socioeconomic status, education, and history of illicit drug use do not predict poor patient adherence to medications. Depression, lack of patient education, a poor clinician-patient relationship, and active alcohol or illicit drug use predict poor patient adherence to medications.

**Question #7 - Answer is E**

All of the medications listed should ordinarily not be prescribed to treat HIV infection because of their decreased efficacy and/or potential for adverse reactions.

**Question #8 - Answer is B**

Zidovudine (AZT) + lamivudine (3TC) + efavirenz is one of the preferred antiretroviral treatment regimens recommended by the USPHS for initiating treatment of HIV infection. Lopinavir/ritonavir + lamivudine (3TC) + zidovudine (AZT) OR stavudine (d4T) is also a preferred regimen. The other three drug combinations listed are not recommended because of their decreased efficacy and/or potential for adverse reactions.

**Question #9 - Answer is E**

The use of abacavir is associated with a hypersensitivity reaction characterized by fever, rash, nausea, and vomiting. Restarting abacavir after these symptoms have abated can result in a life threatening anaphylactic reaction. Although uncommon, all nucleoside reverse transcriptase inhibitors (NRTIs) can cause a syndrome of lactic acidosis and hepatic failure; immediate discontinuation of the NRTI is indicated. Nevirapine use is associated with hepatic necrosis. Didanosine (ddI) can cause pancreatitis that may be life threatening.

**Question #10 - Answer is A**

Most pregnant women with HIV infection should receive antiretroviral medications since treatment significantly reduces perinatal transmission. The treatment regimen should be selected and timed on a case-by-case basis. Hydroxyurea and efavirenz should not be prescribed due to their teratogenic potential. Women with HIV infection can transmit HIV to their children through breast feeding.

**Question #11 - Answer is C**

The average risk of acquiring HIV from a single percutaneous exposure to HIV-infected blood is 3 in 1,000 (0.3%), but the risk increases with the depth of the injury, if visible blood was present on the device causing the injury, if the device was previously in a vein or artery, and if the source of the exposure was a person with AIDS. Side effects to antiretroviral medications in otherwise healthy persons treated for occupational exposures to HIV may be significant and affect adherence.

**Question #12 - Answer is E**

Pulmonary TB frequently presents in atypical ways in persons with HIV infection, particularly in patients with AIDS. Chest radiographs may not have typical upper lobe infiltrates or cavities suggestive of pulmonary TB, but instead may be normal or mimic other infections such as *Pneumocystis carinii* pneumonia.